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FINAL FEASIBILITY STUDY FOR OPERABLE UNIT 2 (OU 2) VOLUMES 1 AND 2 NAS PENSACOLA FL
1/18/2005
ENSAFE

FEASIBILITY STUDY REPORT
OPERABLE UNIT 2
NAS PENSACOLA
PENSACOLA, FLORIDA

SOUTHNAVFACENGCOM
Contract Number: N62467-89-D-0318
CTO-059

VOLUME 1 OF 2
SECTIONS 1 - 4

Prepared for:

NAVFAC
Naval Facilities Engineering Command
SOUTHERN DIVISION

Comprehensive Long-Term Environmental Action Navy (CLEAN)
Naval Air Station Pensacola
Pensacola, Florida

Prepared by:

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January 18, 2005

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VOLUME 2 OF 2
SECTIONS 5 - 11
AND
APPENDICES A TO C

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EXECUTIVE SUMMARY
FEASIBILITY STUDY FOR OPERABLE UNIT 2

This feasibility study (FS) develops, evaluates, and compares remedial action alternatives (RAAs) that may be used to mitigate hazards and threats to human health and the environment resulting from soil and groundwater contamination at Operable Unit 2 (OU 2) at Naval Air Station Pensacola. OU 2 is comprised of Sites 11, 12, 25, 26, 27, and 30. Remedial investigations of OU 2 are reported in the *Remedial Investigation Report* (EnSafe, 1997) and the *Remedial Investigation Report Addendum* (EnSafe, 2004).

The nature and extent of contamination at OU 2 is defined by the remedial goals for the site, which are defined by Chapter 62-777, Florida Administrative Code (Contaminant Cleanup Target Levels). The characterized media includes surface soil (0 to 2 feet below grade level [bgl]), subsurface soil (2 feet bgl to water table), groundwater, and groundwater discharging to surface water. RI data were initially collected in 1993 and supplemental groundwater data were collected in 1995. In 2003, the subsurface soil and groundwater were comprehensively assessed to determine the current status of contamination. Therefore, 1993 data were used to define the nature and extent of surface soil contamination, whereas 2003 data were used to define the nature and extent of subsurface soil and groundwater contamination. The media-specific and contaminant-specific remedial volumes are calculated based on the cleanup target level exceedances.

Media-specific RAAs are developed on a site-wide basis for OU 2. Although there is presumptive interaction between the soil and groundwater media, separate media-specific RAAs are developed because they principally address different receptors. Site-wide RAAs are developed because remedial actions would presumably be performed concurrently for Sites 11, 12, 25, 26, 27, and 30, and contamination is similar. The assembled alternatives may contain multiple treatment technologies. As stated in Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01, the assembled alternatives should preferably include a no-action alternative, one or more containment alternatives, one or more treatment alternatives, and a removal alternative.

The RAAs developed for soil contamination include the following:

- No Action
- Institutional Controls
- Soil and Asphalt Capping
- Phytoremediation Covers and Asphalt Capping
- Excavation and Offsite Disposal

The RAAs developed for groundwater contamination include the following:

- No Action
- Riparian Corridors
- Permeable Reactive Barrier and Riparian Corridors
- Groundwater Pumping and Discharge to Federally Owned Treatment Works
- Groundwater, Pumping, Treatment, and Discharge to Wetlands

A detailed analysis was performed by evaluating the RAAs using the nine criteria stipulated in the National Oil and Hazardous Substances Contingency Plan (40 CFR §300.430) and OSWER Directive 9355.3-01. The detailed analysis and presentation of pertinent information permits decision makers to adequately compare the alternatives, select an appropriate site remedy, and satisfy the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedy selection requirements in the Record of Decision. The comparative analyses of the media-specific RAAs are summarized in Tables 8-1 and 8-2 of this report.

List of Abbreviations

µg/L	micrograms per liter
µg/kg	micrograms per kilogram
1,2-DCA	1,2-dichloroethane
1,2-DCE	1,2-dichloroethene, 1,2-dichloroethylene
ABB	ABB Environmental Services, Inc.
ACL	alternate concentration level
ARAR	applicable or relevant and appropriate requirement
BEHP	bis(2-ethylhexyl)phthalate
BEQ	benzo(a)pyrene equivalent
bgl	below grade level
BRA	baseline risk assessment
BRAC	base realignment and closure
BTEX	benzene, toluene, ethylbenzene, and xylene
CAMU	corrective action management unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CG	cleanup goal
C/I	commercial/industrial
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
cm/sec	centimeter per second
COPC	chemical of potential concern
Cr(VI)	hexavalent chromium
CTL	cleanup target level
CWA	Clean Water Act
CY	cubic yard
DRMO	Defense Reutilization and Marketing Office
E/A&H	EnSafe/Allen & Hoshall
E&E	Ecology & Environment
FS	feasibility study
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FGGC	Florida groundwater guidance concentration
FOTW	federally owned treatment works
FPDWS	Florida primary drinking water standard
FR	Federal Register
FSDWS	Florida secondary drinking water standard
FSWQ	freshwater surface water quality criteria
ft^2	square feet
ft/day	feet per day

GAC	granular activated carbon
GCTL	groundwater cleanup target level
G&M	Geraghty & Miller, Inc.
gpd	gallon per day
gpm	gallon per minute
HDPE	high density polyethylene
IAS	initial assessment study
IRP	Installation Restoration Program
ISCTL	industrial soil cleanup target level
IWTP	industrial wastewater treatment plant
LDR	land disposal restriction
LUCA	land use control agreement
MCLG	maximum contaminant level goal
MCL	maximum contaminant level
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MNA	monitored natural attenuation
msl	mean sea level
MSWQ	marine surface water quality criteria
NADEP	Naval Aviation Depot
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Contingency Plan
NEESA	Naval Environmental and Engineering Support Activity
NFESC	Naval Facilities Engineering Service Center
NPDES	National Pollutant Discharge Elimination System
O&M	operation & maintenance
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OU 2	Operable Unit 2 (Sites 11, 12, 25, 26, 27, and 30)
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene, tetrachloroethylene
PPE	personal protective equipment
ppm	parts per million
PQG	poor quality groundwater
PRB	permeable reactive barrier
PRG	preliminary remediation goal
PWC	Public Works Center
RAA	remedial action alternative
RACER	Remedial Action Cost Engineering and Requirements system software

RAO	remedial action objective
RASO	Radiological Affairs Support Office
RBC	risk based criteria
RCRA	Resource Conservation and Recovery Act
RC	reference concentration
RD	Remedial design
RG	remedial goal
RI	remedial investigation
ROD	Record of Decision
RSCTL	residential soil cleanup target level
SARA	Superfund Amendments and Reauthorization Act
SCTL	soil cleanup target level
SDWA	Safe Drinking Water Act
SEGS	Southeastern Geological Society
SL-PQG	soil leaching criteria protective of poor quality groundwater
SL-SW	soil leaching criteria protective of surface water
SMCL	secondary maximum contaminant level
SQAG	sediment quality assessment guideline
S/S	solidification/stabilization
SSL	soil screening level
SSV	sediment screening value
SVE	soil vapor extraction
SVOC	semivolatile organic compound
TAL	target analyte list
TCE	trichloroethene, trichloroethylene
TCLP	toxicity characteristic leaching procedure
TEL	threshold effect level
TRPH	total recoverable petroleum hydrocarbons
UIC	underground injection control
UPB	unit price book
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
UTS	universal treatment standard
VC	vinyl chloride
VOC	volatile organic compound
yd^2	square yard
ZVI	zero-valent iron

1.0 INTRODUCTION

1.1 Report Purpose

This feasibility study (FS) develops, evaluates, and compares remedial action alternatives (RAAs) that may be used to mitigate hazards and threats to human health and the environment resulting from soil and groundwater contamination at Operable Unit 2 (OU 2) at Naval Air Station (NAS) Pensacola. OU 2 is comprised of Sites 11, 12, 25, 26, 27, and 30. Remedial investigations of OU 2 are reported in the *Remedial Investigation Report Operable Unit 2* (EnSafe, 1997) and the *Remedial Investigation Report Addendum Operable Unit 2* (EnSafe, 2004).

1.2 Report Organization

This FS is prepared pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) of 1986. This report is organized as outlined in the Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, October 1988). The FS is organized as follows:

- **Section 1 — Introduction:** Discusses the purpose and organization of the FS.

- **Section 2 — Site Description:** Describes OU 2 sites and discusses their operational and investigative history, and summarizes the nature and extent of contamination.

- **Section 3 — Feasibility Study Process:** Describes the regulatory process for conducting an FS. Remedial action objectives (RAOs) are developed using characterization and assessments made in the RI and by considering applicable or relevant and appropriate requirements (ARARs), which are presented in Appendix A.

- **Section 4 — Nature and Extent of Contamination:** Identifies the areas requiring analysis, based on the RAOs. Media-specific remedial goal exceedances are identified and the volumes and/or areas requiring remedial action are estimated.

- **Section 5 — Technology Screening:** Identifies potential remedial technologies and provides a cursory evaluation based on the criteria of effectiveness, implementability, and cost. Inappropriate technologies are removed from further consideration, and several technologies are retained for the assembly of RAAs.

- **Section 6 — Assembly of Alternatives:** Assembles the retained technologies into media-specific RAAs for OU 2. RAAs are evaluated on the criteria of implementability, effectiveness, and cost.

- **Section 7 — Detailed Analysis of Alternatives:** Evaluates the individual alternatives according to the nine evaluation criteria identified in OSWER Directive 9355.3-01 (USEPA, October 1988).

- **Section 8 — Comparative Analysis of Alternatives:** Compares performance of alternatives, presenting strengths and weaknesses to prioritize the alternatives according to the nine evaluation criteria.

2.0 SITE DESCRIPTION

The *Remedial Investigation Report Operable Unit 2* (EnSafe, 1997) and *Remedial Investigation Report Addendum Operable Unit 2* (EnSafe, 2004) provide a comprehensive description, the site characterization, and the baseline risk assessment (BRA) of OU 2. In this FS, this section summarizes the OU 2 site descriptions, investigative history, nature and extent of contamination, and BRA. In Section 4, the nature and extent of contamination is defined in terms of the remedial goals.

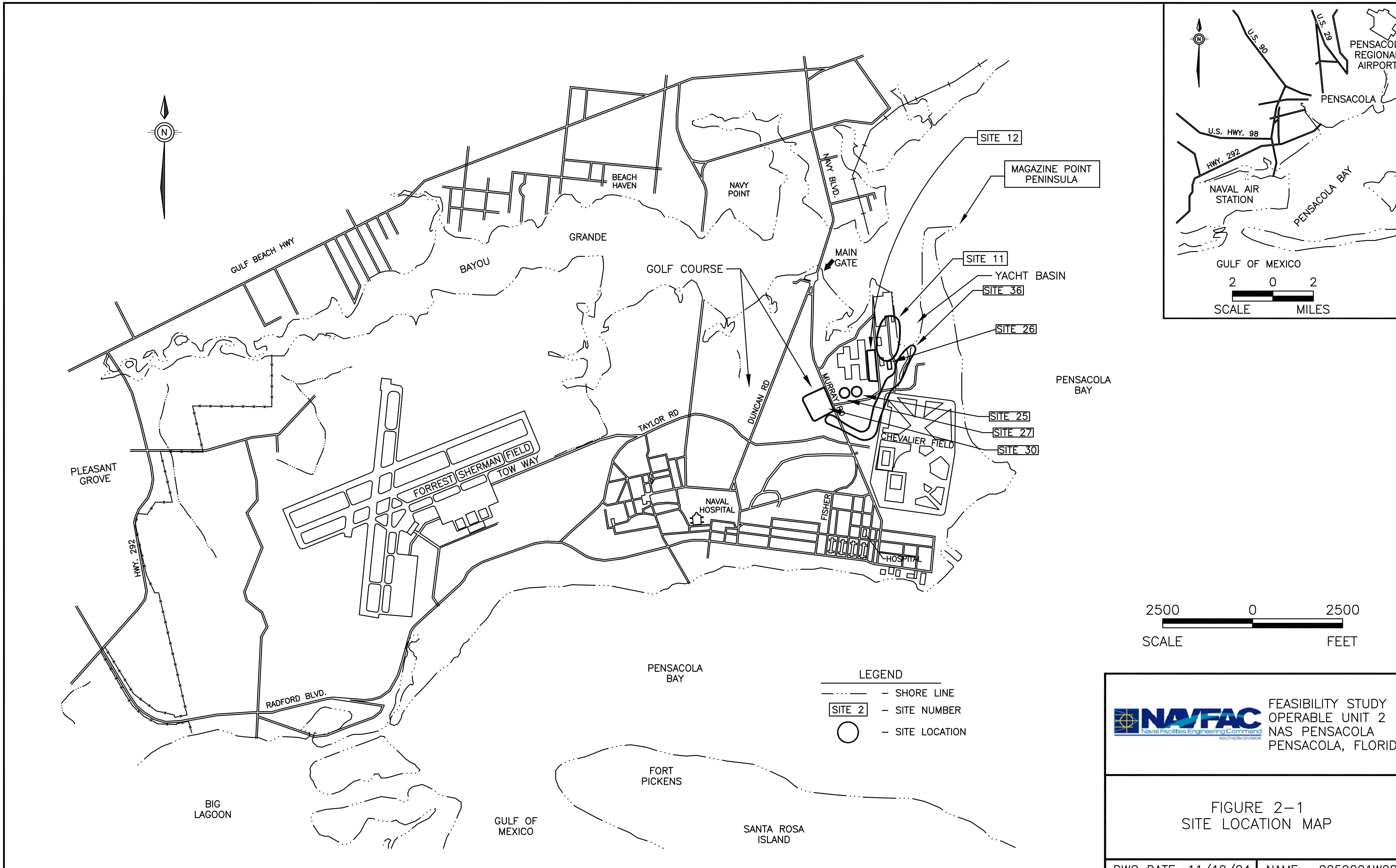
2.1 Site Descriptions and History

OU 2 (Sites 11, 12, 25, 26, 27, and 30) is in the northeast portion of NAS Pensacola as shown in Figure 2-1 and Figure 2-2. These sites were grouped together as an operable unit because they are near each other within the same watershed. OU 2 extends from the western edge of the golf course east to the Yacht Basin.

2.1.1 Site 11 — North Chevalier Field Disposal Area

The North Chavalier Field Disposal Area, Site 11, is a former landfill where industrial and municipal wastes were disposed and burned from the late 1930s to the mid-1940s. The area occupies approximately 20 acres southwest of an extension of Bayou Grande called the Yacht Basin. Surface elevations on the site are approximately 5 feet above mean sea level (msl), and topography slopes gently eastward toward Bayou Grande. Two prefabricated buildings — Buildings 3627 and 3628 — are near the center of the site. Building 3445, at the site's southeastern corner, is used to store outdated office equipment. A fenced area north and south of Buildings 3445 is used for outside storage of boats, trucks, and heavy equipment. Pat Bellinger Road runs north-south through the center of Site 11.

According to the initial assessment study (IAS) conducted by the Naval Facilities Engineering Service Center (NFESC), this landfill was used to burn refuse through the mid-1940s. During this time, it received combustibles such as fuels, solvents, and waste oil from aircraft engine overhauls. During landfill operations from the early 1930s to the 1940s, approximately 24 cubic yards (CYs) of material



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OPERABLE UNIT 2
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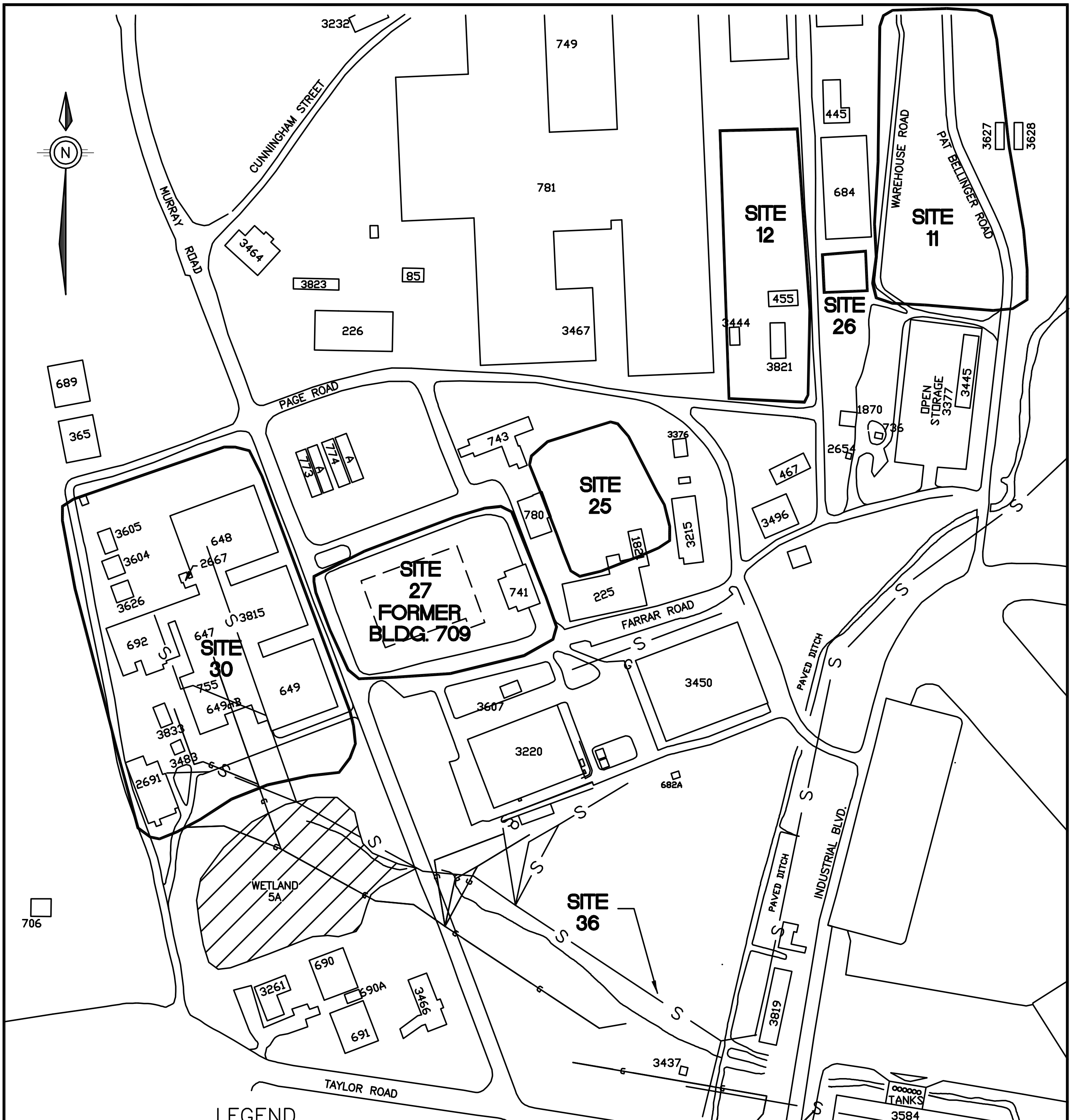
FIGURE 2-1
SITE LOCATION MAP

DWG DATE: 11/19/04 | NAME: 0059001W089



LEGEND

SITE 27	– SITE LOCATION
——S——	– SITE 36
═══	– ROAD

400 0 400

SCALE FEET

FEASIBILITY STUDY
OPERABLE UNIT 2
NAS PENSACOLA
PENSACOLA, FLORIDA

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SOUTHERN DIVISION

FIGURE 2–2
SITE AREA MAP

DWG DATE: 11/18/04 | NAME: 0059001W088

were disposed of daily from several NAS Pensacola locations. During this time, an unknown number of 55-gallon drums of unknown contents was observed. Until the 1950s, oil slicks were noted during heavy rains in the Yacht Basin (Naval Environmental and Engineering Support Activity, [NEESA], 1983).

2.1.2 Site 12 — Scrap Bins

Site 12 is currently referred to as the Defense Reutilization and Marketing Office (DRMO) Recyclable Materials Center and used to store scrap metal. The site is approximately 800 feet northwest of former Chevalier Field and immediately west and upgradient of Site 26. Most of the site area is enclosed by a chain-link fence and covered with a large concrete pad where heavy equipment is stored. Surface elevations average 15 to 18 feet above msl, and the terrain is relatively flat. The limited exposed surface soil is sandy and well drained. Buildings 455 and 3821 are in the southern portion of the site. Building 455 houses an office, break area, and storage warehouse, whereas Building 3821 is a storage warehouse.

From the early 1930s to the 1940s, garbage was stored at Site 12 in an area known as "Pig Sty Hill" near Building 455. Approximately 16 CYs (two truckloads) per day of wet garbage were stored here before being hauled off for livestock feed. The site has since been used as a scrap metals storage area (NEESA, 1983).

2.1.3 Site 25 — Radium Spill Area

The approximately 50-foot x 50-foot concrete-paved area is on the eastern portion of NAS Pensacola, immediately east of Murray Road and north of Farrar Road. The site includes an area east of the radium decontamination building (Building 780) where the radium spill is reported to have occurred. A former helicopter scrap yard approximately 25 feet east of Building 780 is currently used as a parking area for Navy Exchange semi-trailers. The fenced yard is unpaved and covered with interlocking, perforated metal sheets. Building 780 currently houses the Joint Oil Analysis Laboratory, which is used for quality assurance analysis of oil from aircraft and vehicles. The site is flat with land surface elevations averaging approximately 22 to 25 feet above msl. Where exposed, site surface soil is sandy and well drained.

Building 780 was constructed in 1951 to house the oxygen and carbon dioxide shops. In approximately 1975, a radium decontamination operation was added. Radium wastes from this operation were stored in a drum onsite before being disposed. In 1978 a spill occurred in the storage area between Building 780 and the scrap yard. Approximately 25 gallons of low-level radium paint waste spilled from a ruptured, eroded drum onto the underlying concrete floor (NEESA, 1983). The waste was reportedly cleaned up, placed in a secure container, and sent to a proper disposal site. The exact location of the spill, the details of the cleanup operation, and whether the waste reached unpaved soil were not determined from the existing records (Ecology and Environment [E&E], 1992a).

2.1.4 Site 26 — Supply Department Outside Storage Area

The Supply Department Outside Storage Area, Site 26, is northwest of former Chevalier Field and immediately south of Building 684. The approximately 150-foot x 200-foot area houses an open metal shed near a former chemical storage building. DRMO uses this area to store paints, fuels, and solvents. Site access is limited by an 8-foot chain-link fence surrounding the storage area. The concrete pavement inside the fence is bordered by sandy soil and mowed grass. Site 26 is bounded on the west by a paved road and on the east by a wooded area (Site 11). The site gently slopes eastward to a topographic break where elevations abruptly drop to approximately 5 feet above msl.

From 1956 until 1964, the supply department used Site 26 to store incoming paint strippers and acids. Containers of these materials placed outside on steel matting sometimes leaked, discharging the materials onto the ground (Geraghty & Miller [G&M], 1984).

2.1.5 Site 27 — Radium Dial Shop Sewer

The Radium Dial Shop Sewer extends through the remaining concrete foundation of Building 709, which is currently a parking lot. The building foundation is 2 to 4 feet above the surrounding area. Beyond the building formation, the sewer easement is unpaved. The site is approximately 150 feet west of Building 780 (Site 25) and bounded by Farrar and Murray roads on the south and west, respectively. An adjacent parking lot north of the building foundation is asphalt paved, and a gravel and shell parking lot is northeast of the foundation. All area roads are paved with either concrete or asphalt. Originally, the site consisted of a small radium dial shop in former Building 709 with a connection to the sanitary sewer. However, recent investigations have associated additional areas of contamination with the site, expanding the area of investigation to approximately 6 acres.

Building 709, constructed in 1941, was used for several operations, including carburetor repair, propeller repair, painting and maintenance, various instrument shops (including a radium paint room), and a plating shop (E&E, 1992b). In 1949, a small shop in Building 709 was used to rework luminous instrument dials. Worn and damaged instruments were returned to this shop to be stripped and repainted. From 1941 to 1965, the stripping procedure required soaking the instruments in benzene, scraping them in a benzene or water bath, or dry scraping and painting them under a ventilation hood. After 1965, the procedure switched to scanning the instruments for radium, then stripping them with paint stripper and a lye-nitric acid solution. Contaminated instrument cases were soaked in another acid solution called "Turco" then scrubbed with a wire brush (NEESA, 1983).

Building 709 also housed a large plating operation from 1941 to approximately 1970. The operation involved the use of 50 solution tanks ranging from 50 to 3,865 gallons in capacity (E&E, 1992b).

A routine disposal operation in Building 709 involved washing spent cleaning solutions and luminous paint down the drains into the sanitary sewer. The disposed wastes from this location included cleaning solutions containing benzene, white pigments, phosphorus, radium, and small amounts of acidic or caustic solutions. Plating wastes from Building 709 and shops in Building 604 and 649/755 were periodically dumped through drains into the sanitary sewer. Most of the building drains connected to a single line draining into the sanitary sewer line. From 1941 to 1948, all wastes from Building 709 were discharged directly into Pensacola Bay. From 1941 to 1962, concentrated cyanide wastes from Building 709 were periodically dumped into the sanitary sewer. After 1962, the cyanide was drummed and disposed 15 miles offshore in the Gulf of Mexico although small quantities of cyanide continued to be discharged into the sewer. Plating operations ceased in Building 709 in 1970 or 1973 (NEESA, 1983). Building 709 has been removed, and the old building floor is used as a parking lot.

2.1.6 Site 30 — Complex of Industrial Buildings and IWTP Sewer Line

The approximate 35-acre site houses a complex of industrial buildings – known as the Building 649 complex (interconnected Buildings 647, 648, 649, 692, 755, 3815, and several smaller separate, associated buildings). Housing the Dynamic Component Division of the former Naval Aviation Depot (NADEP), several aircraft component repair functions were carried out here. Operations in this complex began in the 1940s and continued until NADEP closed. Also included in the Site 30 investigation were the areas surrounding Buildings 3220 and 3450, former NADEP buildings where aircraft electronics were repaired. The Site 30 investigation also included a portion of the industrial wastewater treatment plant (IWTP) sewer line from the Building 649 complex to the wastewater treatment plant. The portions of the sewer investigated with Site 30 include those associated with Sites 25, 27, and 30, and downstream segments. The portions include the segment extending from the Building 649 complex, the feeder line from Building 3220, and the main line running to the IWTP.

Aircraft and parts were painted in booths in the Building 649 complex beginning in 1940. The paints used at NAS Pensacola were cellulose nitrate lacquer, zinc chromate, nitrate dope, acetate dope, "day glow," epoxy, and enamel. Thinners used were lacquer thinner, toluene, and M-T-6096 (NEESA, 1983).

A tin-cadmium plating shop operated in the Building 649 complex from the mid-1940s to the early 1960s. At this time, it was replaced by a magnesium treatment line, which operated until the early 1970s. Near Building 649, 15 tanks ranging in capacity from 200 to 500 gallons contained solutions of tin, cadmium, and cyanide. Additionally, a 250-gallon tank stored trichloroethene (TCE) (NEESA, 1983), and a 500-gallon underground storage tank (UST) on Building 649's north end stored waste oil (Graham, 1993, personal communication). The contents were drained periodically into a "ditch" east of the buildings. Based on current topography and historical data, this "ditch" was either Wetland 5A or a topographical low draining into it. When the tin-cadmium operation was replaced by a magnesium treatment line in the early 1970s, the 15 tanks near Building 649 were then used to store acids, caustics, degreasers, chromate solutions, and potassium permanganate (NEESA, 1983).

In the summer of 1994 as part of an interim removal action, the Public Works Center (PWC) removed an aircraft engine shipping container from Wetland 5A immediately southeast of Building 649. The shipping container had been used as an oil-water separator. Wetland 5A was sampled under the Site 41 investigation. A second plating shop in Building 755 was used from the early 1960s until the early 1970s. Fifty tanks ranging in capacity from 50 to 200 gallons contained metal plating solutions, including nickel, chromium, silver, lead, and tin (NEESA, 1983).

Concentrated cyanide wastes generated in Buildings 649 and 755 were disposed in the same manner as Building 709's cyanide waste. Disposal involved discharging the wastes down the sewer from 1941 to 1962, discarding drummed waste in the gulf after 1962. Overflow discharged into the sewer (NEESA, 1983).

An empty fiberglass UST mounted in concrete is still near Building 692's southeast corner. Installed in 1986, this tank stored JP-1/JP-5 (jet fuel) calibration fluid for use in Building 692. The fiberglass tank replaced an older steel tank also used to store calibration fluid. The older tank had at least one undocumented spill. A UST along the west side of Building 692 supplied Building 755 with methyl ethyl ketone (MEK) via underground pipes. Several other USTs were along the entire north side of Building 692; their exact contents are unknown. Some of the storage tanks may have contained chromium wastes (Graham, 1993, personal communication).

In 1973, minor painting operations began in Building 3450 (NEESA, 1983). Several 1,000-gallon USTs along the south wall of Building 3450 were reportedly used to store gasoline (ABB Environmental Services, Inc. [ABB], 1993).

Several tanks near Building 3220 included a diesel UST near the southeast corner, a waste oil UST on the south wall, and a series of USTs approximately 50 feet south of the waste oil tank (ABB, 1993).

The wastewater treatment plant, originally built in 1948, was replaced in 1971 with a modern plant that could accept industrial wastes. Most facilities discharging to the sewer did so without any pretreatment or waste segregation. The waste stream has included paint strippers, heavy metals, pesticides, radioactive wastes, fuels, cyanide waste, and waste oil (NEESA, 1983).

Beginning in 1973, the Naval Air Rework Facility operations discharged to the sewer instead of to Pensacola Bay. The IWTP sewer line consisted of vitreous clay and cast-iron piping installed both before and after 1971.

2.2 Previous Investigations

The section summarizes events and investigations relevant for the OU 2 sites.

1976 — Radiation Survey/Removal: According to NEESA accounts, the Radiological Affairs Support Office (RASO) conducted an investigation of radium contamination in the drain lines at the demolished Building 709 area (Site 27). Portions of the drain pipe, linoleum floor, walls, and wood flooring within the dial plating shop were identified as radioactive. The contaminated drain pipe was excavated to a depth of 18 inches, and the remaining area was capped and abandoned.

1983 — Initial Assessment Study: The IAS involved review of historical documents and aerial photographs, interviews, and site inspections. Although 29 sites were identified as having possible contamination, none were thought to have an immediate risk to human health or the environment. Sediment samples were taken from Bayou Grande near Site 11, and metals were detected above toxicity levels. The IAS recommended seven sites, including Sites 11 and 27, for a confirmation study of the suspected contaminants (NEESA, 1983).

1984 — Verification Study: As a follow-up to NEESA's report, G&M installed several monitoring wells and piezometers throughout NAS Pensacola, involving all the OU 2 sites except for Sites 12 and 25. At Site 11, volatile organic compounds (VOCs) were detected and additional wells were recommended. Samples from one drilled well at Site 27 detected gross alpha below drinking standards and chlorinated hydrocarbons. Additional wells were recommended. A well was drilled north of Building 648, next to Site 30 at former Site 31. Low concentrations of VOCs were detected. Sediment samples collected from a presumed "ditch" at Site 30 contained concentrations of cadmium, magnesium, and copper (G&M, 1984).

1986 — Characterization Study: Several sites were investigated in this study. VOCs were detected in wells northwest of former Chevalier Field (Site 11). VOCs were not detected in a deep well at Site 27. No further action was recommended for Sites 27 and 30. Lead, mercury, and VOCs were detected at Site 11. Two zones of contamination were identified at Site 11, and additional work was recommended (G&M, 1986).

1991 — Site Investigation: VOCs and radioactive contamination were evaluated in soil at Sites 25 and 27, and all parameters were at or near background levels (ABB, 1991).

1991, 1992 — Contamination Assessment/Remedial Activities Investigations: As part of the Navy's Installation Restoration Program (IRP), E&E conducted Phase I contamination assessments for 22 sites to identify principal areas and primary chemicals of potential concern (COPCs) and to recommend subsequent investigations. Fieldwork included site reconnaissance, surface emission surveys, particulate air screening, utilities surveys, soil and groundwater sampling, and hydrologic assessments. Laboratory screening analyses were deficient in their lack of reproducibility. Groundwater samples, which were sampled with bailers and were analyzed unfiltered, were characterized by high turbidity resulting in high metal results. The findings were reported in interim data reports for each site:

- **Site 11** — Metals, totals recoverable petroleum hydrocarbons (TRPHs), VOCs, polycyclic aromatic hydrocarbons (PAHs), and phenol were present in unsaturated soils over a large area of the site. The soil contamination was attributed to past waste disposal and burning activities at the site. Groundwater was contaminated with metals at concentrations exceeding primary drinking water standards. TRPHs, VOCs, PAHs, and phenols were also present in groundwater. Some wells contained floating petroleum product. Potential impacts to Bayou Grande from soil and groundwater contamination at Site 11 were noted (E&E, 1991a).

- **Site 12** — Contamination was detected in sediment, soil, and groundwater. Metals, TRPHs, VOCs, PAHs, phenols, and polychlorinated biphenyls (PCBs) were the primary contaminants.

A potential source of radiation was documented to be in the southeast area of the site. Further investigation was recommended (E&E, 1991b).

- **Site 26** — The Site 26 investigation conclusions stated that limited soil and groundwater contamination was present. Metals (arsenic, cadmium, and chromium), TRPHs, VOCs, and PAHs were the primary contaminants. Further investigation was recommended (E&E, 1991c).

- **Site 25 and 27** — This investigation involved a screening surface radiation survey, a soil head-space survey, and soil and groundwater sampling. At Site 25, analyses showed isolated areas of TRPH, PCBs, metals, and radium-226 contamination in soil, and metals and radium-226 in groundwater. All wells contained concentrations of radium-226 near or above primary drinking water standards (E&E, 1992a). At Site 27, metals were observed in soil near the drain and sewer lines at the former Building 709 location. Metals and radium-226 were detected where the apparent surface spills occurred south of the building. VOCs, PAHs, and phenols were detected on the north side of the building. Groundwater results showed metals and radium-226 near the spill locations and radium-226 at the drain and sewer lines. Arsenic, lead, TRPHs, phenols, and xylene were detected in groundwater at the north side of the former building (E&E, 1992b).

- **Site 30** — Metals, TRPHs, PAHs, phenols, and VOCs were detected in surface water, groundwater, and soil. The most contaminated areas were near the Building 648 complex and next to Site 11. Further assessment was recommended (E&E, 1991c). Although metals, TRPH, VOC, and PAH contamination were identified near the IWTP sewer, the IWTP sewer was not identified as the source (E&E, 1992c).

1992 — Site Inspection Report: Site 25 and 27 surface soil samples were analyzed for target analyte list (TAL) metals, Resource Conservation and Recovery Act (RCRA) toxicity characteristic leaching procedure (TCLP) metals, and limited semivolatile organic compounds (SVOCs). Instead of studying source areas, the investigations focused on adjacent areas.

TCLP metals and SVOCs were not detected at concentrations exceeding background. The report concluded that soil in the area sampled would be classified as nonhazardous if removed during the construction of a proposed cold storage facility (ABB, 1991).

1992 — Naval Aviation Depot Installation Restoration Conference: ABB presented results from 18 UST investigations at NAS Pensacola. Groundwater data were presented from one UST near Building 709, four USTs in the Building 648/649 complex, and five USTs near Buildings 3220 and 3450. Most USTs showed petroleum and solvent contamination. The study documented contaminants and presented isoconcentration-contoured plots for some parameters. This presentation was not formally published. This presentation resulted in the transfer of solvent contaminated UST sites to the IRP.

1992 — USEPA Field Investigation for Sites 1, 11, and 30: The US Environmental Protection Agency (USEPA) sampled surface water, sediment, and four wells near Site 11, along with the wetlands associated with Site 30. Metals were detected in sediment at Bayou Grande next to Site 11 and in the wetlands south of the Building 648 complex. Recommendations included additional sampling in Bayou Grande, the removal of the waste receiving structure in Wetland 5A, and follow-up sampling (USEPA, 1992).

1993 — Contamination Assessment Report, South of Building 3450: The investigation identified TRPH contamination in soils and chlorinated contaminants in groundwater near a former UST site in Site 30 (ABB, 1993).

1994 — Wetland 5A Removal Action South of Buildings 649 and 755 in Site 30: The Navy PWC removed and properly disposed of a waste-receiving structure and its contents, along with all sediment that exceeded photoionization detector measurements of 10 parts per million (ppm). The waste receiving structure was sent to DRMO for recycling. The sludge and other contents were classified and disposed as nonhazardous waste.

Silt fencing was used during the project and precautions were taken to reduce the impact of the removal action to the downgradient wetlands. Three surface water samples were collected from a downgradient location before, during, and after the removal action to assess the impacts to the downgradient Wetland 5B. The highest concentrations were found in the sample collected before removal, which indicates that the removal action did affect Wetland 5B. Sediment samples were collected from beneath the waste-receiving structure and oil/water separator immediately after their removal. Both sediment samples exceeded the Florida Department of Environmental Protection (FDEP) sediment quality assessment guidelines for a variety of constituents. Wetland 5A contamination is addressed in the Site 41 RI (EnSafe, *in press*).

1995 — Base Realignment and Closure (BRAC); Remodeling at Buildings 3220 and 3450: Buildings 3220 and 3450, which are southeast of Sites 25, 27, and 30, were remodeled as part of the BRAC construction for the Naval Training Center. Construction alteration to the site included repaving parking lots, new electrical corridors, and a radar tower. A few monitoring wells were damaged during construction activities. The construction was complete and available for student occupancy in spring of 1996.

1997 — Remedial Investigation: The RI field investigation for OU 2 was conducted between July 1993 and December 1995. Shallow (0 to 1 foot) and subsurface (1 foot to the water table in 2-foot increments) soil samples were collected using hollow stem auger drilling techniques and trenches. Groundwater samples were collected in two phases. The Phase I groundwater sample locations were based on previous investigations and a preliminary soil gas survey, whereas Phase II locations were determined by consensus at the January 1995 Tier I Partnering meeting. Phase I samples were collected using a Grundfos pump or with bailers, and Phase II samples were collected with a peristaltic pump using a low-flow sampling protocol. Thus, the Phase II groundwater samples had a lower turbidity and lower concentrations of metals and sorbed species. The RI investigation also included radium-226 screening at Sites 12, 25, 26, and 27; a contaminant source survey; a habitat and biota survey; and specific capacity testing of constructed monitoring wells.

2004 — Remedial Investigation Addendum: In preparation for the FS, Phase III soil and groundwater samples were collected to assess the conditions of OU 2 in 2003. Twenty-five direct push borings were advanced, and 32 soil samples were collected from the same intervals that leachability-based FDEP soil cleanup target levels were exceeded in the RI. Groundwater samples were collected from 69 strategic locations, which were selected based on previous FDEP groundwater cleanup target level exceedances or in locations in the middle or downgradient of previously identified plumes. The analytical parameters included metals, pesticides/PCBs, SVOCs, VOCs, and monitored natural attenuation (MNA) indicator parameters. The new data were compared to previous analytical data to document changes from the RI and to support this FS.

2.3 Summarized Remedial Investigation Findings

This section briefly summarizes the sources and nature and extent of contamination reported in the RI. In Section 4, the RI and RI addendum data are compared with the remediation goals in order to determine the nature and extent of contamination.

2.3.1 Site 11 — North Chevalier Field Disposal Area

The source of contamination was identified to be a former landfill, where trenching revealed evidence of a "seam" of blackened debris at the water table. This oily material contained finely corroded bits of metal and other debris.

The BRA identified soil inorganic COPCs at Site 11 as arsenic, beryllium, cadmium, chromium, and iron. Soil organic COPCs are Aroclor-1260 and benzo(a)pyrene equivalents (BEQs). Groundwater inorganic COPCs are arsenic and beryllium. Groundwater organic COPCs are 1,2-dichloroethene (1,2-DCE), aldrin, chloroform, 1,2-dichloroethane (1,2-DCA), dieldrin, 1,1,2,2-tetrachloroethane, tetrachloroethene (PCE), TCE, and vinyl chloride (VC).

2.3.2 Site 12 — Scrap Bins

The Site 12 soil contaminants included primary/secondary metals, PCBs, and SVOCs. The storage of scrap metals contributes to metals contamination at this site. Though none were noted during the RI field investigation, past storage of old transformers pending their disposal is a possible contributor to the PCB contamination at Site 12. Residual fuels and oils from scrapped aircraft and vehicles stored at the site are possible sources of SVOCs at Site 12. Radium-226 contamination was found at two locations in the north-central portion of Site 12 and in a 15-foot x 50-foot area near the southeast corner of the site.

The BRA identified soil inorganic COPCs at Site 12 as arsenic, cadmium, and iron. Soil organic COPCs are Aroclor-1260 and BEQs. In addition, soil samples contained radium-226 in amounts equal to four times the standard in 40 Code of Federal Regulations (CFR) 192.12. COPCs identified in groundwater were Aroclor-1260, chloroform, 1,1-DCE, dieldrin, heptachlor epoxide, and PCE.

2.3.3 Site 25 — Radium Spill Area

Soil samples collected behind Building 780 revealed a wide range of primary/secondary metals and SVOC contamination. Shallow wells next to the building contained primary and secondary metals, and an adjacent intermediate depth well contained metals, as well as chlorinated solvents, benzene, and xylene. Improper storage and disposal of materials at Building 780 are possible sources of soil and groundwater contamination. Another location of concern at Site 25 is the storage yard behind Building 225, used as a metal prefabricating shop by the NAS Pensacola PWC. This yard contains racks of metal sheeting, piping, etc. Shallow and intermediate wells located here contained numerous primary and secondary metals exceedances, as well as PCE and TCE. Activities in and around this building are a possible source for contamination in these wells. The loading dock where the radium-paint spill and cleanup occurred was investigated, but no evidence of radium-226 contamination was found.

The BRA identified soil inorganic COPCs at Site 25 as arsenic, beryllium, cadmium, chromium, and iron. Soil organic COPCs are Aroclor-1254, Aroclor-1260, BEQs, and dieldrin. All inorganic COPCs identified in Phase I groundwater samples were eliminated from the risk assessment because inorganic analytes in Phase II groundwater samples did not exceed hazard indices greater than 1. Groundwater organic COPCs are chlorinated VOCs (1,1-DCE, chloroform, PCE, TCE, and VC).

2.3.4 Site 26 — Supply Department Outside Storage Area

No significant contamination was detected at Site 26. No inorganics contributed to risk in Site 26 soil. BEQs in Site 26 soil samples elevate the risk close to the 1E-06 threshold. Groundwater inorganic COPCs are arsenic, beryllium, and cadmium. Groundwater organic COPCs are dieldrin and PCE.

2.3.5 Site 27 — Radium Dial Shop Sewer

Known as the Radium Dial Shop, Site 27 is on the remaining concrete foundation of former Building 709, which is currently a parking lot. At Site 27, SVOC exceedances were noted from wells previously installed by ABB in support of UST removals at this location. The former UST locations are possible contributors of contamination in these wells. The radiological survey revealed a small area south of former Building 709. From the size of the area, the contamination appeared to be a spill adjacent to an old stairway from Building 709. Outside this limited area, no significant soil radiological contamination was found anywhere on these sites.

The BRA identified soil inorganic COPCs at Site 27 as aluminum, arsenic, cadmium, chromium, iron, and mercury. Soil organic COPCs are dieldrin and BEQs. In groundwater, chromium, iron, and manganese contributed to a cumulative hazard index greater than 1. Groundwater organic COPCs are 1,4-dichlorobenzene, 1,1-DCE, 1,2-DCA, dieldrin, chloroform, PCE, and TCE, and have associated risk projections ranging from 1E-06 to 6E-04.

2.3.6 Site 30 — Complex of Industrial Buildings and IWTP Sewer Line

At Site 30, numerous former ABB wells associated with previous UST removals within the Building 649 complex revealed chlorinated solvents and benzene in groundwater exceeding preliminary remediation goals (PRGs). EnSafe/Allen & Hoshall (E/A&H) wells installed on the western side of this complex revealed SVOC and VOC exceedances in groundwater. Aboveground storage tanks at this complex, the former USTs, and associated buried piping are considered sources for this contamination. Several former ABB wells in and around Building 3220 exhibited benzene, chlorinated solvents, and phenol in groundwater exceeding PRGs. Also, former ABB wells south of Building 3450 exhibited phenol in groundwater above PRGs. All of these ABB wells were associated with former UST removals. A shallow well (30GS154) installed on the north side of Building 3450 exhibited VC and xylene in groundwater above PRGs.

The BRA identified soil inorganic COPCs at Site 30 as arsenic and beryllium. Soil organic COPCs are BEQs and PCBs. Groundwater inorganic COPCs are arsenic, cadmium, and chromium. Groundwater organic COPCs are benzene, chloroform, 1,1-DCE, 1,4-dichlorobenzene, PCE, and 1,1,1-trichlorethane. In addition to noting the risk associated in and around previous UST removals in the Site 30 area of investigation, the BRA noted that groundwater concentrations of VC contribute significantly to elevated risk at locations represented by monitoring well 30GS154.

Site 30 also includes a portion of the IWTP sewer line. The intermediate well (30GI111) adjacent the southwest corner of Building 3189 exhibited chlorinated VOCs, benzene, iron, manganese, and sodium above PRGs for groundwater. Activities at the former hazardous materials accumulation area likely contributed to this contamination. Samples from well 30GS103 installed in a fenced storage yard directly north of Building 3644 (a former NADEP building), contained primary/secondary metals contamination, as well as chlorobenzene. Nearby well 30GS101 contained xylene and benzene. The contamination in 30GS103 is likely attributable to NADEP activities at Building 3644. Well 30GS101 is adjacent the IWTP and may be impacted from IWTP activities. Chlorobenzene and toxaphene were detected at well 30GS123 near a lift station for the IWTP sewer line. Past spills from this lift station are the suspected contributors of this contamination. The BRA found that groundwater concentrations of arsenic, benzene, 1,4-dichlorobenzene, and VC contribute significantly to elevated risk while chlorobenzene and iron contribute significantly to elevated hazard indices at the location represented by monitoring well pair 30GS111 and 30GI111. Other than 30GI111 for Site 36, the BRA only addressed soil boring 30S102, north of the Building 3644 complex, reporting elevated risk concentrations for BEQs.

2.4 Potential Receptors

OU 2 has been an industrial area supporting supply, maintenance, and disposal activities for more than 40 years. The contaminants within OU 2 appear to be limited to the surface and subsurface soils, the surficial aquifer, groundwater to surface water discharge, and areas where point source or non-point source storm water discharges occur (e.g. wetlands). Current and potential receptors include the following:

- The surficial zone of the sand-and-gravel aquifer, which is not used as a potable water source due to taste and odor characteristics.

- The main producing zone of the sand-and-gravel aquifer, which is used as a potable water source in Escambia County and underlies the surficial zone but is separated by a confining clay unit.

- NAS Pensacola Wetland 5A, which receives runoff from the southwestern portion of the OU 2 area (Site 30).

- NAS Pensacola Wetland 5B, which drains Wetland 5A to Wetland 6 (Sites 36, 25, and 27).

- The concrete-lined drainage ditch, also known as NAS Pensacola Wetland 6.

- The Yacht Basin, an arm of Bayou Grande, which receives runoff and groundwater flow from the areas of Sites 11, 12, 25, and 26.

The low permeability clay layer between the surficial and main producing zones may inhibit any downward contaminant migration into the deeper groundwater below the clay. The coastal waters of surrounding NAS Pensacola have been classified by the FDEP as Class III surface water, which indicates their use for recreation and maintenance of a well-balanced fish and wildlife population. Potential ecological impacts on wetland areas adjacent OU 2 and Bayou Grande are addressed in separate RI/FSs for Bayou Grande (Site 40) and the NAS Pensacola Wetlands (Site 41).

3.0 FEASIBILITY STUDY PROCESS

The overall objective of the CERCLA remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste. The RI is used to assess site conditions and the risk assessment process is used to assess risk and hazard based on RI findings. These data are used to gauge the magnitude of site risk and identify possible areas requiring FS. At OU 2, Sites 11, 12, 25, 27, and 30 were recommended for FS.

The FS comprises the following elements:

- **Development of Remedial Action Objectives** — This includes the definition of ARARs, the development of RAOs, the delineation of areas that exceed remedial goals (RGs) and require feasibility analysis, and the estimation of associated impacted volumes.

- **Technology Screening** — This includes the identification of remedial process options that address site contaminants, the evaluation of these technologies using implementability, effectiveness, and cost criteria, and the screening of these technologies.

- **Assembly of Alternatives** — Suitable technologies, which are retained based on engineering judgment, are assembled into viable RAAs. A conceptual design is developed and evaluated using implementability, effectiveness, and cost criteria. This second screening process identifies advantages and disadvantages of each remedial approach.

- **Detailed Analysis of Alternatives** — The assembled alternatives are evaluated using the nine criteria specified in 40 CFR §430(e)(9)(iii) (the National Oil and Hazardous Substances Contingency Plan [NCP]). The nine criteria are used to evaluate each alternative's overall protection of human health and the environment and compliance with statutory requirements.
- **Comparative Analysis of Alternatives** — The RAAs are comparatively evaluated using the nine NCP criteria.

3.1 Development of Remedial Action Objectives

The RAA selection process begins during RI planning, when PRGs are set based on readily available information such as presence of chemical-specific ARARs. As the RI/FS proceeds, goals are modified as needed to reflect understanding of the site and its ARARs. Final RGs are established when the remedy is selected. The goals must consider ARARs and must establish acceptable exposure levels that are protective of human health and the environment.

In developing RAOs for the FS, four issues were addressed:

- PRGs based on chemical-specific ARARs.
- Spatial distribution of contamination in the media of concern, as determined by the RI.
- Human health and ecological assessments, including exposure pathways, addressed in the BRA.
- Potential groundwater contamination by contaminant residuals in site soil.

3.1.1 Chemical-Specific Applicable or Relevant and Appropriate Requirements and To-Be-Considered Criteria

As per the NCP, RGs shall establish acceptable exposure levels that are protective of human health and the environment and are developed by considering the following:

- ARARs under federal environmental or state environmental or facility sitting laws, if available, and the following factors:
  - — For systemic toxicants, acceptable exposure levels shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effects during a lifetime or part of a lifetime, incorporating an adequate margin of safety.

— For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk of between 1E-06 and 1E-04. The 1E-06 risk level shall be used as the point of departure for determining RGs for alternatives when ARARs are not available or are not significantly protective due to the presence of multiple contaminants or exposure pathways.

— Technical limitations, quantitative limits, uncertainties, etc.

- Non-zero maximum contaminant level goals (MCLGs), established under the Safe Drinking Water Act (SDWA), are relevant and appropriate for ground or surface waters that are current or potential drinking water sources. When MCLGs are set at zero, the maximum contaminant levels (MCLs) shall be attained when relevant and appropriate to the circumstances of the release.

- In cases involving multiple contaminants or pathways where attainment of chemical-specific ARARs will result in cumulative risk in excess of 1E-04, risk- or technology-based goals may be developed.

- Water quality criteria established under the Clean Water Act (CWA) shall be attained where relevant and appropriate.

- Alternate concentration levels (ACLs) may be established in accordance with CERCLA Section 121(d)(2)(B)(ii).

- Environmental evaluations shall be performed to assess threats to the environment.

Chemical-specific ARARs will be considered in developing RAOs for the site.

A review of potential ARARs, shown in Appendix A, identified potential RGs for OU 2. Proposed Rule 62-780, Florida Administrative Code (FAC), stipulates the cleanup criteria for OU 2.

Proposed Rule 62-780 addresses contaminated site cleanup criteria and references contaminant cleanup target levels in Rule 62-777, FAC. As discussed in Rule 62-777, FAC, the RGs for soil may include the following:

- Residential soil cleanup target levels (SCTLs), which do not require land use restrictions.
- Commercial/industrial SCTLs, which require land use restrictions.
- Leachability SCTLs based on groundwater criteria.
- Leachability SCTLs based on surface water (marine or freshwater as appropriate).

Because NAS Pensacola is not proposed for realignment and closure, it is reasonable for the base to be evaluated using commercial/industrial (C/I) decision criteria. As discussed in Rule 62-777, FAC, the RGs for groundwater may include the following:

- Primary and secondary drinking water standards, as defined in 62-550, FAC.
- Groundwater cleanup target levels (GCTLs).
- Surface water CTLs for marine and freshwater, as appropriate.

Surface water CTLs are only applicable for groundwater discharging to surface water.

3.1.2 Definition of Remedial Action Objectives and Remedial Goals

RAOs are typically defined once the nature of site contaminants is known. In addition, current and future land use, adjacent property conditions, human health and ecological risk assessments, and other factors may be considered to identify a "reasonable future use" scenario. The identification of site COPCs, as well as the future use scenario, enables decision makers to develop site-specific RGs that are protective of human health and the environment, but which are not overly conservative given probable exposure scenarios.

Proposed Rule 62-780, FAC, provides three risk management options to be pursued. The risk management options are described as follows:

- Level I — No further action without institutional or engineering controls, 62-780.680(1), FAC.

- Level II — No further action with institutional controls and, if appropriate, engineering controls that are agreed to by the real property owners of the source property, 62-780.680(2), FAC.

- Level III — No further action with institutional controls and, if appropriate, engineering controls that are agreed to by the real property owners of all properties subject to the institutional or engineering controls, 62-780.680(3), FAC.

In this FS, remedies will be identified and evaluated that meet the RAOs defined by Risk Management Option Level II.

3.1.3 Delineation of Areas Exceeding Remedial Goals

Once RAOs and RGs are defined, media exceeding RGs can be identified. At OU 2, the environmental media exceeding RGs are soil and groundwater. FDEP has required point-by-point compound-specific compliance with RGs; therefore, constituents in each soil boring and each groundwater monitoring well are compared with RGs. The soil and groundwater exceedances of the CTLs are discussed in Section 4 and summarized in Appendix B.

3.1.4 Environmental Media Volumes Exceeding Remedial Goals

The volumes of environmental media that exceed CTLs are estimated from data reported in the *Remedial Investigation Report* (EnSafe, 1997) and the *Remedial Investigation Report Addendum Operable Unit 2* (EnSafe, 2004). The estimated volumes of environmental media requiring remedial action are necessary to select appropriate remedial alternatives and develop the cost estimates for these remedies.

3.2 Technology Screening

After impacted media volumes are defined, the next step in the FS process is identification of technologies applicable to site contaminants. Once technologies are identified, they are reviewed for effectiveness, implementability, and cost. Technologies are either eliminated or retained for further consideration. The screening is done on a media-specific basis and site-by-site basis for OU 2 because of the various contaminants identified and ongoing use requirements at the base.

3.2.1 CERCLA Response Actions

The NCP provides guidance for conducting the RI/FS and the process for remedy selection. The stated purpose of the selection process is to assure that implemented remedies protect human health and the environment by eliminating, reducing, and/or controlling risks posed through each pathway. The goal of the FS process is to select remedies based on fundamental criteria, including the following:

- Protection of human health and the environment
- Compliance with ARARs
- Minimization of untreated hazardous waste

3.2.2 Program Management Principles

Sites should be remediated in OUs when 1) reduction of significant risk must be accomplished quickly, 2) a phased analysis and response is necessary or appropriate given the size or complexity of the site, or 3) when the expected final remedy must be expedited. Interim responses should not be inconsistent with implementation of the expected final remedy, nor should they preclude it. Site-specific data needs, alternative evaluation, and documentation of the selected remedy should reflect the scope and complexity of site problems being addressed.

3.2.3 Expectations

In the NCP, USEPA broadly categorizes remedial action alternatives into general response actions for consideration in the FS. Remedial action categories include the following:

- **Treatment** — Use treatment to address the principal threats posed by a site, where practical.

- **Containment** — Use engineering controls such as containment for waste that poses a relatively low long-term threat or where treatment is impractical.

- **Combination** — Combine appropriate methods to protect human health and the environment.

- **Institutional Controls** — Use institutional controls such as water and deed restrictions to supplement engineering controls as appropriate for short- or long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants. Institutional controls will not be substituted for active response measures as the sole remedy unless such active measures are determined to be impractical based on the balance of tradeoffs among alternatives determined during remedy selection.

- **Innovative Technology** — Consider an innovative technology when it offers the potential for comparable or better treatment, performance, or ease of implementation, less adverse impacts, or lower costs than demonstrated technologies.

- **Groundwater Restoration** — Restore usable groundwater to its beneficial uses whenever practical in a reasonable amount of time. Where this cannot be accomplished, USEPA expects to prevent further migration of the plume, prevent exposure to contaminated groundwater, and evaluate further risk reduction.

3.2.4 General Response Actions

General response actions are media-specific actions that can achieve RAOs alone or in combination with other actions. Response action alternative types include the following:

- **Source Control Actions** — Source control actions are a range of alternatives in which treatment is used to reduce the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants. The range considered in an FS should include an alternative that removes or destroys these constituents of concern to the maximum extent feasible, eliminating or minimizing the need for long-term management. In addition, alternatives are to be considered that treat the principal threats posed by the site but vary in the degree of treatment and the amount and characteristics of residuals and untreated waste that must be managed.

- **Containment Actions** — One or more alternatives should be considered that protect human health and the environment primarily by preventing or controlling exposure to site contaminants through engineering or institutional controls. Examples include engineering controls such as extraction or injection wells and institutional controls such as deed or access restrictions.

- **Groundwater Response Actions** — A limited number of groundwater remediation actions should be assessed that attain site-specific goals within different restoration time periods. These alternatives should use one or more methods such as groundwater extraction, treatment, and in situ actions.

3.2.5 Identification of Technologies

This section provides general descriptions of technology types that may be applied to meet the response actions described above.

No Action/Limited Action— The NCP requires evaluation of a no-action alternative as a basis of comparison with other RAAs. Because no action may result in contaminants remaining onsite, CERCLA requires a review and evaluation of site conditions every 5 years if this alternative is selected.

Natural Attenuation — Natural attenuation refers to dilution, dispersion, advection, and biotic degradation of contaminants in the environment. Consideration of this option requires modeling and evaluation of contaminant degradation rates and transport during remedial design. Sampling and sample analysis must be conducted throughout the process to confirm that attenuation is proceeding at rates that meet remediation objectives and to ensure that receptors are not threatened.

Institutional Controls — Institutional controls reduce potential hazards by limiting public exposure, as opposed to reducing volume, mobility, or toxicity of hazardous substances. Examples of institutional controls include:

- Site access controls
- Public awareness and education
- Groundwater use restrictions
- Long-term monitoring
- Deed restrictions
- Warning against excavation and soil use

Removal/Excavation — Removal/excavation provides complete removal of contaminated media. Examples include the excavation of soil with heavy equipment and the removal of groundwater via groundwater extraction wells and subsurface drains.

Containment — Groundwater is contained by installing a network of extraction wells or subsurface drains to produce a hydraulic barrier and eliminate or reduce the migration of groundwater. Vertical barriers such as slurry walls, high-density polyethylene (HDPE) sheeting, or sheet piling may also be used to reduce horizontal contaminant transport in groundwater from contaminated soil zones. A surface cap of asphalt, concrete, soil barriers, or synthetic membranes indirectly provides containment by reducing contaminant transport through soil by minimizing the percolation of water through soils. These containment options can be used alone or together to isolate contaminated soil and/or groundwater.

Ex situ Treatment — Ex situ groundwater treatment technologies include groundwater extraction, air stripping, bioreactor, carbon absorption, and precipitation. Soil may be treated ex situ by multiple technologies such as excavation and offsite disposal, soil washing, landfarming, thermal desorption, and solidification and stabilization.

In situ Treatment — In situ groundwater treatment technologies include air sparging, vertical barriers, treatment walls, geochemical fixation, cosolvent/surfactant flushing, electrokenetic remediation, and enhanced bioremediation. Soil may be treated in situ by multiple technologies, including vitrification, bionutrification, solidification and stabilization, and thermal extraction.

Discharge/Disposal — Groundwater may be treated and discharged to the federally owned treatment works (FOTW), treated and discharged to surface water, or reinjected into the aquifer. Excavated soil may be disposed offsite at a hazardous or nonhazardous waste landfill, used as site fill material, or isolated in an onsite containment unit.

3.2.6 Preliminary Technology Screening

Once the treatment technologies are identified, they are screened on a site-specific basis using the criteria implementability, effectiveness, and cost.

Implementability — Encompasses a technology's technical and administrative feasibility. Technical implementability is used to eliminate technology types and process options that are clearly ineffective or unworkable. Information from RI site characterization is used to screen out technologies and process options. Administrative implementability emphasizes institutional aspects such as the ability to obtain necessary permits for offsite actions; the availability of treatment, storage, and disposal services (including capacity); and the availability of necessary equipment and skilled workers to implement the technology.

Effectiveness — Screening is based on how effective each technology would be in protecting human health and the environment. Each technology should be evaluated with regard to its effectiveness in providing protection and reducing the toxicity, mobility, or volume of contamination. Both short- and long-term effectiveness should be evaluated. Short term refers to construction and implementation, whereas long term refers to the period after the remedial action is complete.

Cost — Plays a limited role in the screening process. Relative capital and operation and maintenance (O&M) costs are used rather than detailed estimates. At this stage in the process, the cost analysis is based on engineering judgment, and each process is evaluated based on whether costs are high, low, or medium relative to other process options.

3.3 Assembly of Alternatives

Following the identification and screening of technologies, general response actions and process options are combined to form alternatives that address the entire site. These process options were chosen as representatives of technology types. In assembly alternatives, the NCP goal of evaluating a range of alternatives was considered. Where possible given the size of the site and the extent of RG exceedances, the alternatives vary in level of effort, balance of containment versus treatment measures, cost, and remediation time frame. Alternatives have been developed to respond separately to remedial needs for groundwater and soil.

Definitions of each alternative should provide sufficient information to distinguish the alternatives with respect to effectiveness, implementability, and cost. The following information should be included in each definition:

- Locations of areas to be excavated or contained.

- Approximate volumes of soil and/or groundwater to be managed.

- Size and configuration of onsite excavation and treatment systems or containment structures.

- Approximate locations of wells, trenches, treatment systems, etc.

- Management options for treatment residuals.
- For media with several hazardous constituents, it may be necessary to identify which contaminant(s) impose the greatest treatment requirements.
- Remediation time frame.
- Rates or flows of treatment.
- Spatial requirements for treatment or containment actions.
- Distances for disposal actions.
- Required permits for offsite actions and imposed limitations.

In short, the alternative description should include enough information to adequately explain the alternative and document the logic behind the proposed action.

After development, each alternative is screened again using the three general criteria of implementability, effectiveness, and cost.

Implementability — Measures both the technical and administrative feasibility of constructing, operating, and maintaining an alternative. Technical feasibility refers to the ability to construct, operate, and meet ARARs and includes an assessment of O&M and monitoring. Administrative feasibility refers to interactions with other agencies, availability of treatment, and any specific or unusual requirements.

Effectiveness — Is evaluated through an assessment of how each alternative provides protection and the degree to which it reduces toxicity, mobility, or volume. Short-term effectiveness is evaluated according to the implementation period; long-term effectiveness assesses conditions after the remedial action is completed.

Cost — Is assessed in greater detail at this stage than in the initial technology screening. A variety of cost-estimating data are considered to develop both capital and O&M costs. The cost estimates in this FS were prepared using the Remedial Action Cost Engineering and Requirements (RACER) system, version 2005. RACER is a parametric cost modeling system used to develop costs for environmental projects, technologies, and processes. Costs are primarily derived from the unit price book (UPB), which is developed by the Tri-Services Cost Engineering Group, but also include other specialized assemblies. RACER was submitted for formal validation, verification, and accreditation in accordance with Department of Defense Instruction 5000.61 and was accredited for the following intended use:

> To provide an automated, consistent and repeatable method to estimate and document the program cost for the environmental cleanup of contaminated sites and to provide a reasonable estimate for program funding purposes consistent with the information available at the time of the estimate preparation.

3.4 Detailed Analysis of Alternatives

Once identified, remedial alternatives are evaluated with respect to the requirements stipulated in CERCLA as amended, the NCP (40 CFR §300.430), OSWER Directive 9355.9-19 (USEPA, December 24, 1986), and factors described in OSWER Directive 9355.3-01 (USEPA, October 1988).

The detailed analysis of alternatives provides decision makers with the information needed to select an appropriate site remedy. During the detailed analysis, each alternative is assessed against the evaluation criteria described in the OSWER Directive 9355.3-01 and the other alternatives. Assessment results are arrayed to compare the alternatives and identify key tradeoffs among them. The results of the detailed analysis provide the basis for identifying a preferred alternative and preparing a proposed plan. This approach is designed to provide decision makers with sufficient information to adequately compare the alternatives, select an appropriate remedy for a site, and satisfy CERCLA requirements for selecting the remedial action.

This section summarizes the nine evaluation criteria used to evaluate the remedial alternatives, as defined in 40 CFR §300.430. These criteria have been categorized as threshold criteria, balancing criteria, and modifying criteria. The remedial alternatives are individually evaluated with these nine criteria in Section 7 and comparatively evaluated in Section 8.

3.4.1 Threshold Criterion — Overall Protection of Human Health and the Environment

Each alternative must satisfy this criterion to be eligible for selection. Analysis in this section should provide a final check to assess whether each alternative adequately protects human health and the environment. The overall assessment of protection draws on the assessments conducted under other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

Evaluation of an alternative's overall protectiveness should focus on whether it achieves adequate protection by eliminating, reducing, or controlling the risks posed through each pathway through treatment, engineering, or institutional controls. This evaluation considers whether an alternative poses any unacceptable short-term risk or cross-media impacts.

3.4.2 Threshold Criterion — Compliance with Applicable or Relevant and Appropriate Requirements

Alternatives must meet this criterion to be considered for selection. Compliance with ARARs is used to determine whether each alternative will meet all the federal and state ARARs identified in previous stages of the remedial process. The detailed analysis should identify which requirements are applicable or relevant and appropriate to an alternative. The actual determination of which requirements are applicable or relevant and appropriate is made by the lead agency (the Navy) in consultation with the support agencies (USEPA and FDEP). Compliance with the following ARARs should be addressed for each alternative during the detailed analysis: chemical-specific, location-specific, and action-specific ARARs.

3.4.3 Balancing Criterion — Long-Term Effectiveness and Permanence

The evaluation of alternatives under this balancing criterion addresses the results of a remedial action in terms of the risk remaining at the site after response objectives have been met.

The primary focus of this evaluation is the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes. The following should be addressed for each alternative:

- **Magnitude of Residual Risk —** This factor assesses the residual risk from untreated waste or treatment residuals at the conclusion of remedial activities. This risk may be measured by numerical standards such as cancer risk levels or the volume or concentration of constituents in waste, media, or treatment residuals remaining onsite.

- **Adequacy and Reliability of Controls** — This factor assesses the adequacy and suitability of any controls used to manage treatment residuals or untreated wastes remaining onsite. It may include an assessment of containment systems and institutional controls to determine if they sufficiently ensure that any exposure to human and environmental receptors is within protective levels.

3.4.4 Balancing Criterion — Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion addresses the statutory preference for remedial actions employing treatment technologies that permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances. This is one of the primary balancing criteria on which the detailed analysis is based. The evaluation should consider the following specific factors:

- The treatment processes, the remedies they will employ, and the materials they will treat.

- The amount of hazardous materials that will be destroyed or treated, including how principal threat(s) will be addressed.

- The degree of expected reduction in toxicity, mobility, or volume, measured as a percentage of reduction (or order of magnitude) when possible.

- The degree to which the treatment will be irreversible.

- The type and quantity of treatment residuals that will remain following treatment.

- Whether the alternative would satisfy the statutory preference for treatment as a principal element.

3.4.5 Balancing Criterion — Short-Term Effectiveness

The short-term effectiveness of a remedial alternative is evaluated against its effect on human health and the environment during implementation. This is one of the primary balancing criteria on which the detailed analysis is based. Short-term effectiveness is based on four key factors:

- Risks to the community during implementation of the remedial action.
- Risks to workers during implementation of the remedial action.
- Potential for adverse environmental impact as a result of implementation.
- Time until remedial response objectives are achieved.

3.4.6 Balancing Criterion — Implementability

The implementability criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation. Specifically, this criterion addresses the following:

Technical Feasibility

- Construction and operation relating to the technical difficulties and unknowns associated with a technology.

- Reliability of technology, focusing on the likelihood that technical problems associated with implementation will lead to schedule delays.

- Ease of undertaking remedial action, discussing future remedial actions that may be required, and how difficult it would be to implement such additional actions.

- Feasibility of monitoring the remedy's effectiveness, including an evaluation of the risks of exposure should be insufficient to detect a system failure.

Administrative Feasibility

- Activities needed to coordinate with other offices and agencies.

Availability of Services and Materials

- Availability of adequate offsite treatment, storage capacity, and disposal services.

- Availability of necessary equipment and specialists, and provisions to ensure any necessary additional resources.

- Availability of services and materials, plus the potential to obtain competitive bids, which may be particularly important for innovative technologies.

- Availability of prospective technologies.

3.4.7 Balancing Criterion — Cost

Detailed cost estimates for each remedial alternative are based on engineering analyses and suppliers' estimates of necessary technology. The estimated costs are intended to reflect actual costs with an accuracy of minus 30% to plus 50%, in accordance with USEPA guidelines. This is the final primary balancing criteria on which detailed analysis is based. Costs are expressed in present value dollars. The cost estimate for a remedial alternative consists of four principal elements: capital cost, O&M costs, costs for evaluation reports, and present value analysis. These four elements are further explained as follows.

Capital Costs

- *Direct costs* for equipment, labor, and materials used to develop, construct, and implement a remedial action.

- *Indirect costs* for engineering, financial, and other services that are not actually part of construction, but are required to implement a remedial alternative. The methodology used to estimate the indirect cost varies with the degree of difficulty associated with construction and/or implementation of the alternative. In this FS, the indirect costs include health and safety items, permitting and legal fees, bid and scope contingencies, engineering design and services, and miscellaneous supplies or costs.

Annual O&M Costs

O&M costs refer to post-construction costs necessary to ensure the continued effectiveness of a remedial action. They typically refer to long-term power and material costs (such as the operational cost of a treatment facility), equipment maintenance and replacement, and long-term monitoring.

Evaluation Reports

This refers to the costs associated with reports prepared every 5 years to evaluate the results of the selected alternative.

Present Value Analysis

This analysis makes it possible to compare the RAAs on the basis of a single cost representing an amount that would be sufficient to cover all costs associated with the remedial action during its planned life, if invested in the base year and disbursed as needed. A performance period appropriate to each alternative is assumed for the present value analyses. A discount rate of 6% is used for the present value estimates.

3.4.8 Modifying Criterion — Support Agency Acceptance

This assessment evaluates the technical and administrative issues and concerns USEPA and FDEP may have regarding each alternative. This criterion is largely satisfied through state involvement in the entire remedial process, including review of the FS.

3.4.9 Modifying Criterion — Community Acceptance

This assessment evaluates the public's potential issues and concerns regarding each alternative. As with state acceptance, this criterion will be addressed in the ROD when comments on the FS and proposed plan have been received.

3.5 Comparative Analysis of Alternatives

Once the alternatives have been fully described and individually assessed against the nine criteria, the relative performance of each is evaluated. The purpose of the comparative analysis is to identify the advantages and disadvantages of each alternative in relation to one another. The differences between alternatives for each criterion should be highlighted, especially the balancing criteria. The focus should help determine which options are cost effective and which remedy uses permanent solutions and treatment to the maximum extent practicable.

4.0 NATURE AND EXTENT OF CONTAMINATION

This section describes the nature and extent of contamination at OU 2, as defined by the RGs for the site. Thus, the soil and groundwater investigation data presented in the 1997 RI and 2004 RI Addendum are evaluated pursuant to Chapter 62-777, FAC, which specifies contaminant cleanup target levels (CTLs). The media-specific and contaminant-specific remedial volumes are calculated based on the CTL exceedances.

4.1 Parameters Used to Define Nature and Extent

This section summarizes the samples, RGs, and decision criteria used to estimate the soil and groundwater volumes that require remedial action.

4.1.1 Samples

RI sampling was conducted in three phases at OU 2 and the samples are referred to as Phase I, II, and III samples. The investigated media include surface soil (0 to 2 feet bgl), subsurface soil (2 feet bgl to the top of the water table), and shallow and intermediate groundwater (upper 20 feet and lower 20 feet of the saturated shallow aquifer, respectively). The sampled parameters are grouped into the broad chemical categories of inorganics (metals), pesticides/PCBs, SVOCs, and VOCs in this presentation of the nature and extent of contamination.

Phase I sampling was completed in 1993 and included comprehensive surface soil, subsurface soil, and groundwater sampling. Phase II sampling was completed in 1995 and consisted of groundwater sampling of selected monitoring wells. Because Phase I groundwater samples were collected with bailers, which overestimated the concentration of inorganics, Phase II groundwater samples were collected using a low-flow sampling protocol. Thus, Phase II groundwater samples had less sediment and were more representative of true groundwater conditions. Phase III was a comprehensive sampling investigation conducted in 2003 with the intent of assessing the current conditions of shallow and intermediate groundwater and subsurface soil. Phase III groundwater sample locations include the source areas and the downgradient aquifer. Subsurface soil samples were collected to reassess previously identified hotspots.

Because Phase III samples are comprehensive and recent, they are exclusively used to define the nature and extent of subsurface soil and groundwater contamination in the FS. Because surface soil samples were not collected in Phase III, Phase I samples are used to define the nature and extent of surface soil contamination. The locations of the Phase I surface soil samples, the Phase III subsurface samples, and the Phase III groundwater samples are shown on Figures 4-1, 4-2, and 4-3, respectively.

4.1.2 Remedial Goals

The nature and extent of contamination is based on exceedances of the CTLs, as defined by Chapter 62-777, FAC, Tables I and II. The soil and groundwater sample analytical results were compared with the following CTLs to define the nature and extent of contamination, including the following:

- Surface soil samples were compared with residential and C/I direct exposure SCTLs and groundwater-based leachability SCTLs.

- Subsurface soil samples were compared with groundwater-based leachability SCTLs.

- Groundwater samples were compared with GCTLs based on ingestion (lifetime excess cancer risk of 1E-06) and freshwater and/or marine Class III surface water criteria, as appropriate.

In addition to these screening criteria, all media samples were compared to the NAS Pensacola reference values for inorganics. The results, depicting parameter-specific exceedances for each of the main parameter groups, are included in summary tables and figures. Note that only CTL exceedances are plotted on these accompanying figures; for a plotting of all detections, the reader is referred to the RI and RI addendum.

4.1.3 Decision Criteria for Estimating Remedial Volumes

The contaminant class-specific volume of surface soil, subsurface soil, and groundwater requiring remediation was estimated using the following media-specific decision criteria:

Soil

- Volumetric determinations were based on residential and C/I direct exposure SCTL exceedances for surface soil and leachability-based GCTL exceedances for surface and subsurface soil.

- Isolated impacted soil areas were assumed to extend 20 feet laterally from the sampling point.

Groundwater

- Volumetric determinations were based on monitoring wells with GCTL exceedances.

- The estimates of groundwater distribution were based on the direction of groundwater flow. The adjacent surface water bodies (Wetlands 5A, 5B, 6, 7, and 64) receive groundwater and can be classified as gaining. In gaining water bodies, the potentiometric gradient, and thus the groundwater flow, is generally perpendicular to the surface water body. Therefore, unless the groundwater pathway from a well exhibiting an exceedance had an intervening well that did not exhibit an exceedance, the affected groundwater was estimated to extend from the GCTL exceedance to the nearest wetland.

- To account for dispersion, the affected groundwater was assumed to extend 50 feet laterally from the observed GCTL exceedance.

- The saturated thickness of aquifer matrix used in the calculations was 20 feet for the shallow and 20 feet for the intermediate, for a total saturated aquifer thickness of 40 feet.

- The estimated porosity of the aquifer matrix was 30%.

4.2 Estimated Volumes of Soil and Groundwater that Require Remediation

The soil and groundwater volumes requiring remediation are estimated for the chemical categories of metals, pesticides/PCBs, SVOCs, and VOCs. This section summarizes the sample exceedances, the estimated areal distributions of contamination, and the estimated remedial volumes. The sample results and their CTL exceedances are given in Appendix B.

4.2.1 Metals

Figure 4-4 shows the surface soil samples and estimated areas that exceed the residential direct exposure SCTLs. Given a 2-foot depth of contamination, which is based on surface soil definition, 19,520 CY of surface soil exceed the residential direct exposure SCTL.

Figure 4-5 shows the surface soil samples and estimated areas that exceed the C/I direct exposure SCTLs. Given a 2-foot depth of contamination, 1,590 CY of surface soil exceed the C/I direct exposure SCTL.

Figure 4-6 shows the surface soil samples and estimated areas that exceed the groundwater-based leachability SCTLs for metals. Given a 2-foot depth of contamination, 15,690 CY of surface soil exceed the groundwater-based leachability SCTLs for metals.

Figure 4-7 shows the subsurface soil samples and estimated areas that exceed the groundwater-based leachability SCTLs for metals. Given a 2-foot depth of contamination for the single detection, 120 CY of subsurface soil exceed the groundwater-based leachability SCTLs for metals.

Figure 4-8 shows the groundwater samples and estimated areas that exceed GCTLs for secondary drinking water standard metals, specifically aluminum, iron, and manganese. Based on the decision criteria defined in Section 4.1.3, an estimated 14.4 million gallons of groundwater exceed secondary drinking water standards.

Figure 4-9 shows the groundwater samples and estimated areas that exceed GCTLs for barium, cadmium, chromium, and lead. Based on the decision criteria defined in Section 4.1.3, an estimated 2.26 million gallons of groundwater exceed GCTLs for these metals.

Figure 4-20 shows the groundwater samples adjacent to surface waters that exceed appropriate Class III surface water CTLs. Marine Class III surface water CTLs are appropriate for evaluating the groundwater to surface water exposure pathway adjacent to Wetland 7 and the Yacht Basin, whereas freshwater Class III surface water CTLs are appropriate for evaluating the pathway adjacent to Wetlands 5A, 5B, and 6. Aluminum, cadmium, copper, lead, and zinc have more stringent surface water CTLs than groundwater CTLs. However, the more stringent surface water CTLs does not increase the volume of groundwater requiring remediation.

4.2.2 Pesticides/Polychlorinated Biphenyls

Figure 4-10 shows the surface soil samples and estimated areas that exceed the residential direct exposure SCTLs for pesticides and PCBs. Given a 2-foot depth of contamination, which is based on surface soil definition, 7,530 CY of surface soil exceed the residential direct exposure SCTL for pesticides and PCBs.

Figure 4-11 shows the surface soil samples and estimated areas that exceed the C/I direct exposure SCTLs for pesticides and PCBs. Given a 2-foot depth of contamination, which is based on surface soil definition, 1,780 CY of surface soil exceed the C/I direct exposure SCTL for pesticides and PCBs.

Figure 4-12 shows the surface soil samples and estimated areas that exceed the groundwater-based leachability SCTLs for pesticides and PCBs. Given a 2-foot depth of contamination, 9,210 CY of surface soil exceed the groundwater-based leachability SCTLs for pesticides and PCBs.

There were no exceedances of groundwater-based leachability SCTLs in the subsurface soil samples for pesticides and PCBs. There also were no exceedances of the GCTLs or Class III surface water CTLs for pesticides and PCBs.

4.2.3 Semivolatile Organic Compounds

Figure 4-13 shows the surface soil samples and estimated areas that exceed the residential direct exposure SCTLs for SVOCs. Given a 2-foot depth of contamination, which is based on surface soil definition, 13,550 CY of surface soil exceed the residential direct exposure SCTL for SVOCs.

Figure 4-14 shows the surface soil samples and estimated areas that exceed the C/I direct exposure SCTLs for SVOCs. Given a 2-foot depth of contamination, 3,010 CY of surface soil exceed the C/I direct exposure SCTL for SVOCs.

Figure 4-15 shows the surface soil samples and estimated areas that exceed the groundwater-based leachability SCTLs for SVOCs. Given a 2-foot depth of contamination, 830 CY of surface soil exceeds the groundwater-based leachability SCTLs for SVOCs.

There were no exceedances of groundwater-based leachability SCTLs in subsurface soil for SVOCs.

Figure 4-16 shows the groundwater samples and estimated areas that exceed GCTLs for SVOCs. Based on the decision criteria defined in Section 4.1.3, an estimated 0.82 million gallons of groundwater exceed GCTLs for SVOCs.

Figure 4-20 shows the groundwater samples adjacent to surface waters that exceed appropriate Class III surface water CTLs. Anthracene, fluoranthene, and pyrene have more stringent surface water CTLs than groundwater CTLs. Although the consideration of surface water CTLs results in additional exceedances of anthracene, fluoranthene, and pyrene in sample 030GS006003, these exceedances are marginal and they do not increase the volume of groundwater requiring remediation.

4.2.4 Volatile Organic Compounds

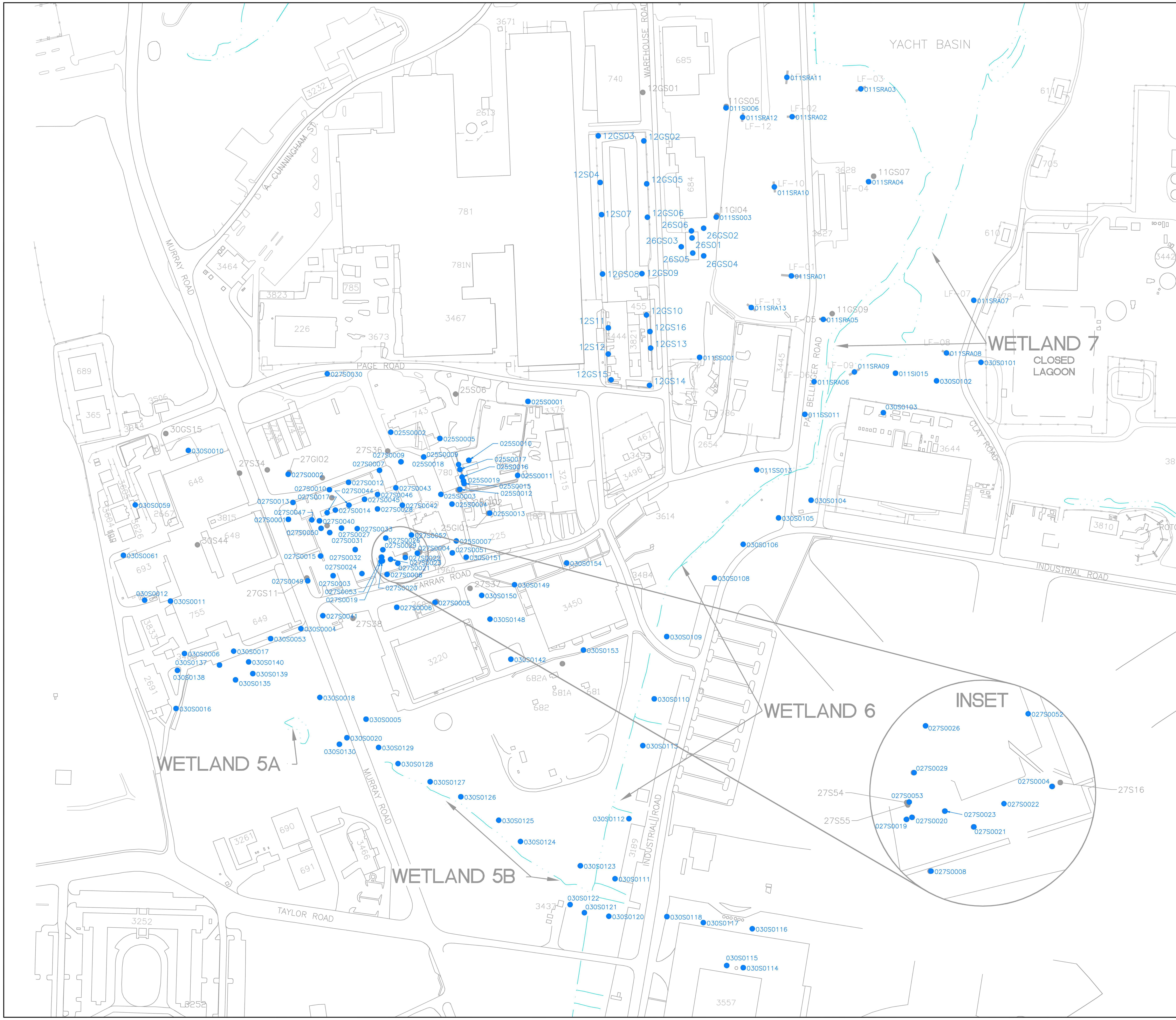
There were no exceedances of the residential or C/I direct exposure SCTLs for VOCs in surface soil.

Figure 4-17 shows the surface soil samples and estimated areas that exceed the groundwater-based leachability SCTLs for VOCs. Given a 2-foot depth of contamination, 2,960 CY of surface soil exceeds the groundwater-based leachability SCTLs for VOCs.

Figure 4-18 shows the subsurface soil samples and estimated areas that exceed the groundwater-based leachability SCTLs for VOCs. Given a 2-foot depth of contamination for the two detections, 240 CY of subsurface soil exceed the groundwater-based leachability SCTLs for VOCs. The two GCTL exceedances were in samples collected immediately above the water table. Contamination in these samples is presumably a consequence of groundwater contamination, as opposed to leached soil contamination. This presumption is based on the lack of contamination above this interval, as determined from of photoionization detector readings, the seasonally variable water table, and the thickness of the capillary fringe. Thus, these leachability SCTL exceedances are associated with the aquifer matrix and not the subsurface soil.

Figure 4-19 shows the groundwater samples and estimated areas that exceed GCTLs for VOCs. Based on the decision criteria defined in Section 4.1.3, an estimated 13.5 million gallons of groundwater exceed GCTLs for VOCs.

Figure 4-20 shows the groundwater samples adjacent to surface waters that exceed appropriate Class III surface water CTLs. Chlorobenzene, ethylbenzene, and total xylenes have more stringent surface water CTLs than groundwater CTLs. Although the consideration of surface water CTLs results in an additional exceedance of total xylenes in sample 030GS006003, this exceedance does not increase the volume of groundwater requiring remediation.



LEGEND

SURFACE WATER BODY

743 BUILDING

LF-12 TRENCH LOCATIONS/IDs

FENCE LINE

ROADS

SIDEWALKS

30S109 ● SURFACE SOIL BORING LOCATION (0-2 FEET BELOW LAND SURFACE)

30S109 ● SOIL BORING LOCATION

NOTES

SAMPLE LOCATION AND ID LABEL DESCRIPTION:
S = SOIL BORING SAMPLE
SRA/SLF = TRENCH SOIL SAMPLE

160 0 160
SCALE FEET

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FEASIBILITY STUDY
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PENSACOLA, FLORIDA

FIGURE 4-1
SURFACE SOIL SAMPLE LOCATIONS
1993

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: T. KAFKA	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W065	Of 1

YACHT BASIN
WETLAND 7
CLOSED LAGOON
WETLAND 6
WETLAND 5A
WETLAND 5B
INSET
011S0006 6–V
012S0003 15–P,PCB
011SLF012 6–M,S
012S0007 5–M
012S0008 5–M 14–P,PCB
012S0010 5–M
012S0009 5–M
012S0016 10–M
012S013 5–M
011S0015 6–M
025S008 14–S
025S009 14–S
025S0005 14–S
027S017 6–S
030S0009 4–M,4,S,P,PCB 6–M,V,S,P,PCB
030S012 12–S 20–V
030S017 6–V 18–V
030S006 8–S
030S138 6–V 20–V
030S137 6–V
030S053 4–V 10–V
030S150 6–V
030S148 6–V
030S142 6–V
030S125 3–V 5–V
030S124 3–V
030S123 4–P,PCB
030S120 6–V
LEGEND
SURFACE WATER BODY
BUILDING
TRENCH LOCATIONS/IDs
FENCE LINE
ROADS
SIDEWALKS
12S0009 5–M SUBSURFACE SOIL BORING LOCATION (GREATER THAN 2 FEET BELOW LAND SURFACE) WITH SAMPLE DEPTH AND PARAMETER GROUP SAMPLED IN MARCH 2003
30S109 NOT SAMPLED IN 2003
SAMPLE ID
DEPTH–PARAMETER GROUP
PARAMETER GROUP KEY
M = METALS
V = VOLATILE ORGANIC COMPOUNDS
S = SEMIVOLATILE ORGANIC COMPOUNDS
P = PESTICIDES
PCB = POLYCHLORINATED BIPHENYLS
NOTES
SAMPLE LOCATION AND ID LABEL DESCRIPTION:
S = SOIL BORING SAMPLE
GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
SRA/SLF = TRENCH SOIL SAMPLE
160 0 160
SCALE FEET
NAVFAC
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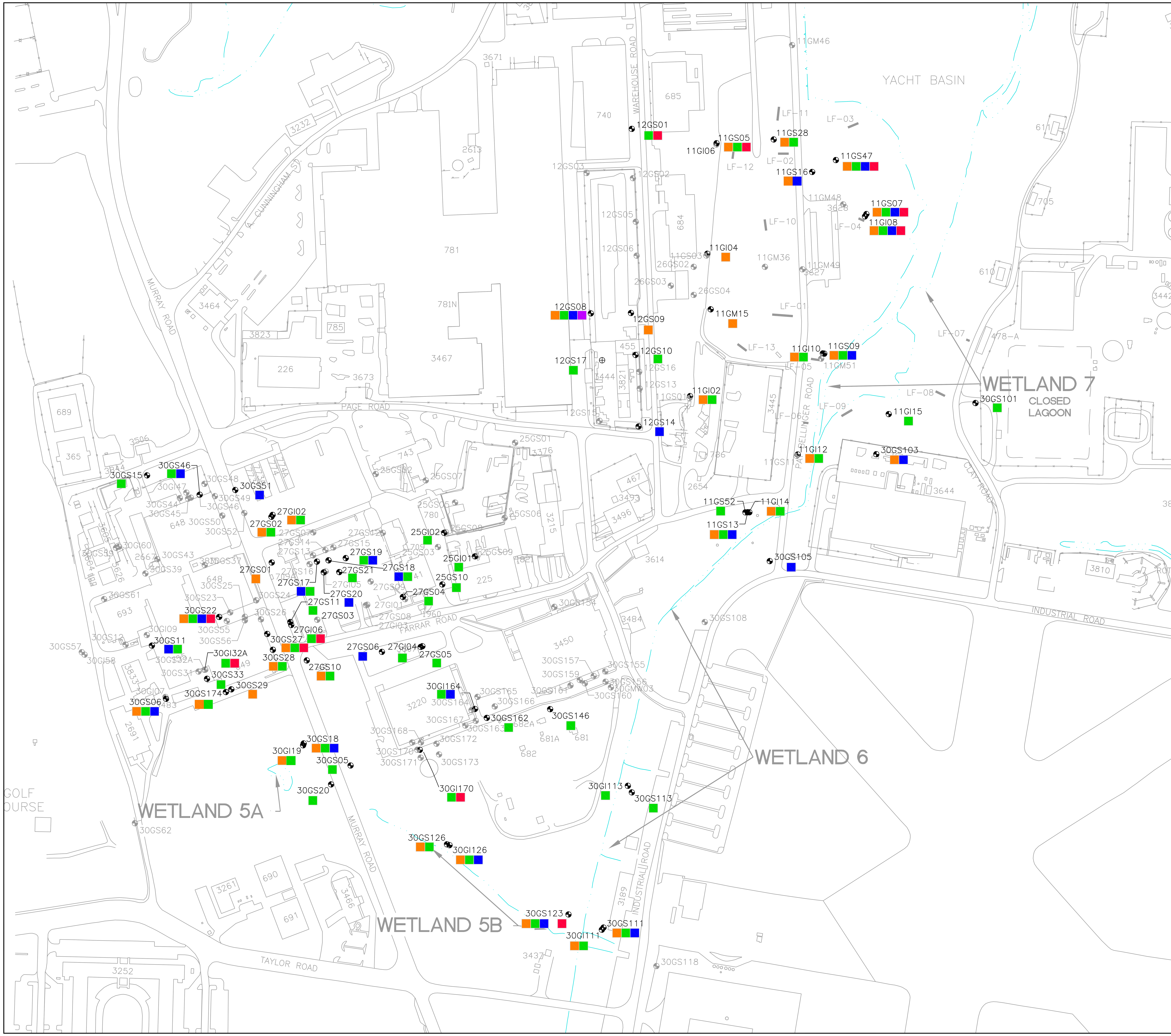
PENSACOLA, FLORIDA
FIGURE 4–2
SUBSURFACE SOIL SAMPLE LOCATIONS
MARCH 2003
Dr by: K. WOOSLEY
Proj. Code: 0059–001
Ck by: C. TRIPP
App by: A. HARRIS
Sheet 1 Of 1
Date: 12JAN05
DWG Name: 0059001W064



LEGEND

SURFACE WATER BODY
BUILDING
TRENCH LOCATIONS/IDs
FENCE LINE
ROADS
SIDEWALKS
30GS111 SHALLOW OR INTERMEDIATE MONITORING WELL SAMPLED AND PARAMETER GROUP
30GS165 MONITORING WELL NOT SAMPLED

RESAMPLING PARAMETERS LEGEND

Metals
Volatile Organic Compounds
Semivolatile Organic Compounds
Pesticides/PCBs
MNA

NOTES

SAMPLE LOCATION AND ID LABEL DESCRIPTION:
GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE

160 0 160
SCALE FEET

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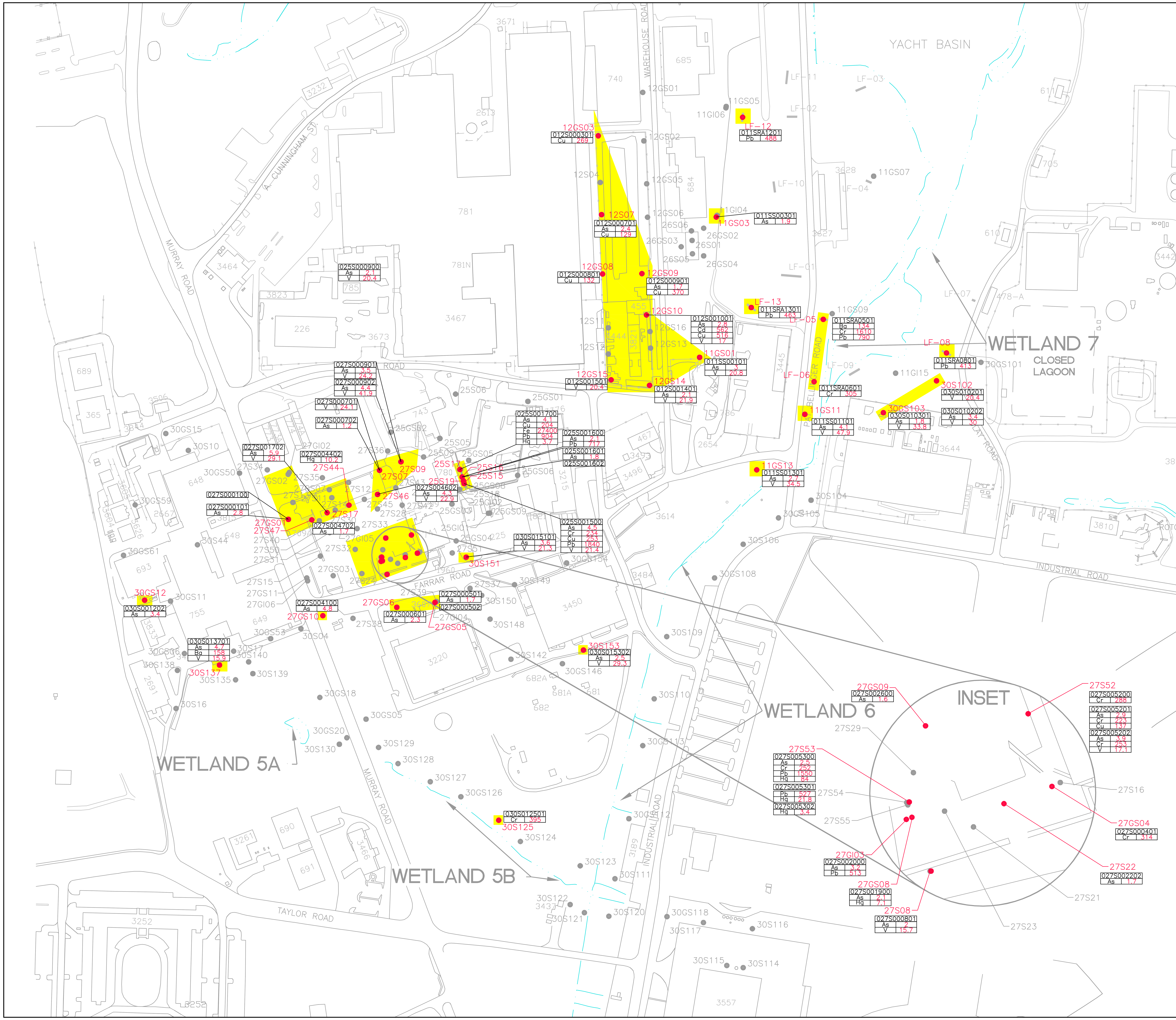
FIGURE 4-3
GROUNDWATER SAMPLING LOCATIONS
MARCH 2003

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W079	Of 1



LEGEND

- SURFACE WATER BODY
- 743 BUILDING
- AREA OF REMEDIAL VOLUME – DEPTH IS 2 FEET
- LF-12 TRENCH LOCATIONS/IDs
- FENCE LINE
- ROADS
- SIDEWALKS
- 11GI15 ● SURFACE SOIL BORING LOCATION EXCEEDING THE RESIDENTIAL DIRECT EXPOSURE SCTL
- 30S109 ● SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

METALS	FDEP Residential Direct Exposure SCTL (ppm)
Arsenic (As)	0.8 (RC=1.56)
Barium (Ba)	110
Cadmium (Cd)	75
Chromium (Cr)	210 (Hexavalent)
Copper (Cu)	110
Iron (Fe)	23000
Lead (Pb)	400
Mercury (Hg)	3.4
Vanadium (V)	15

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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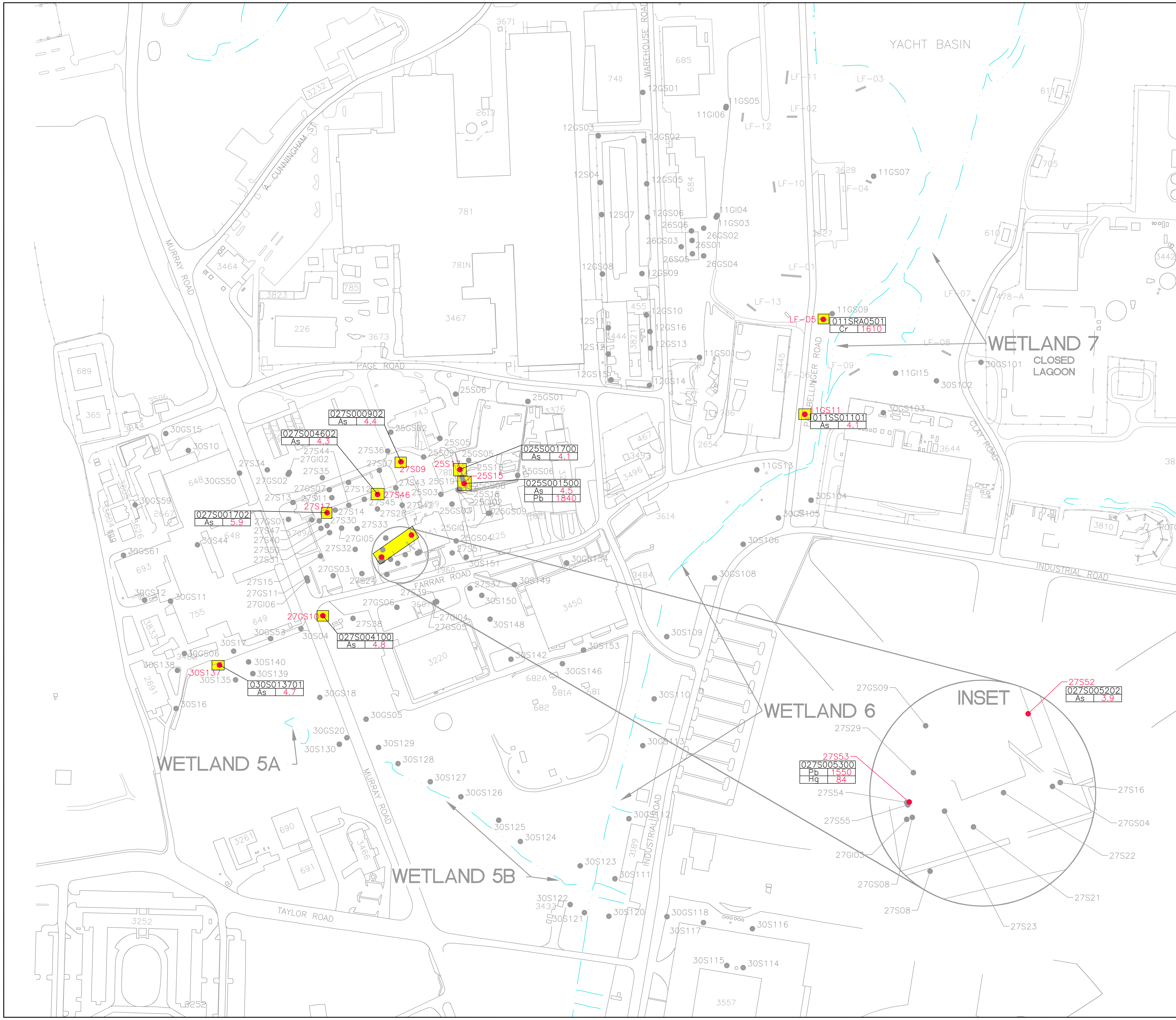
FIGURE 4-4
METALS–RESIDENTIAL DIRECT EXPOSURE SCTL EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W080	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME – DEPTH IS 2 FEET
LF-12	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
11GI15 ●	SURFACE SOIL BORING LOCATION EXCEEDING THE DIRECT C/I EXPOSURE SCTL
30S109 ●	SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

METALS	FDEP Direct C/I Exposure SCTL (ppm)
Arsenic (As)	3.7
Chromium (Cr)	420 (Hexavalent)
Lead (Pb)	920
Mercury (Hg)	26

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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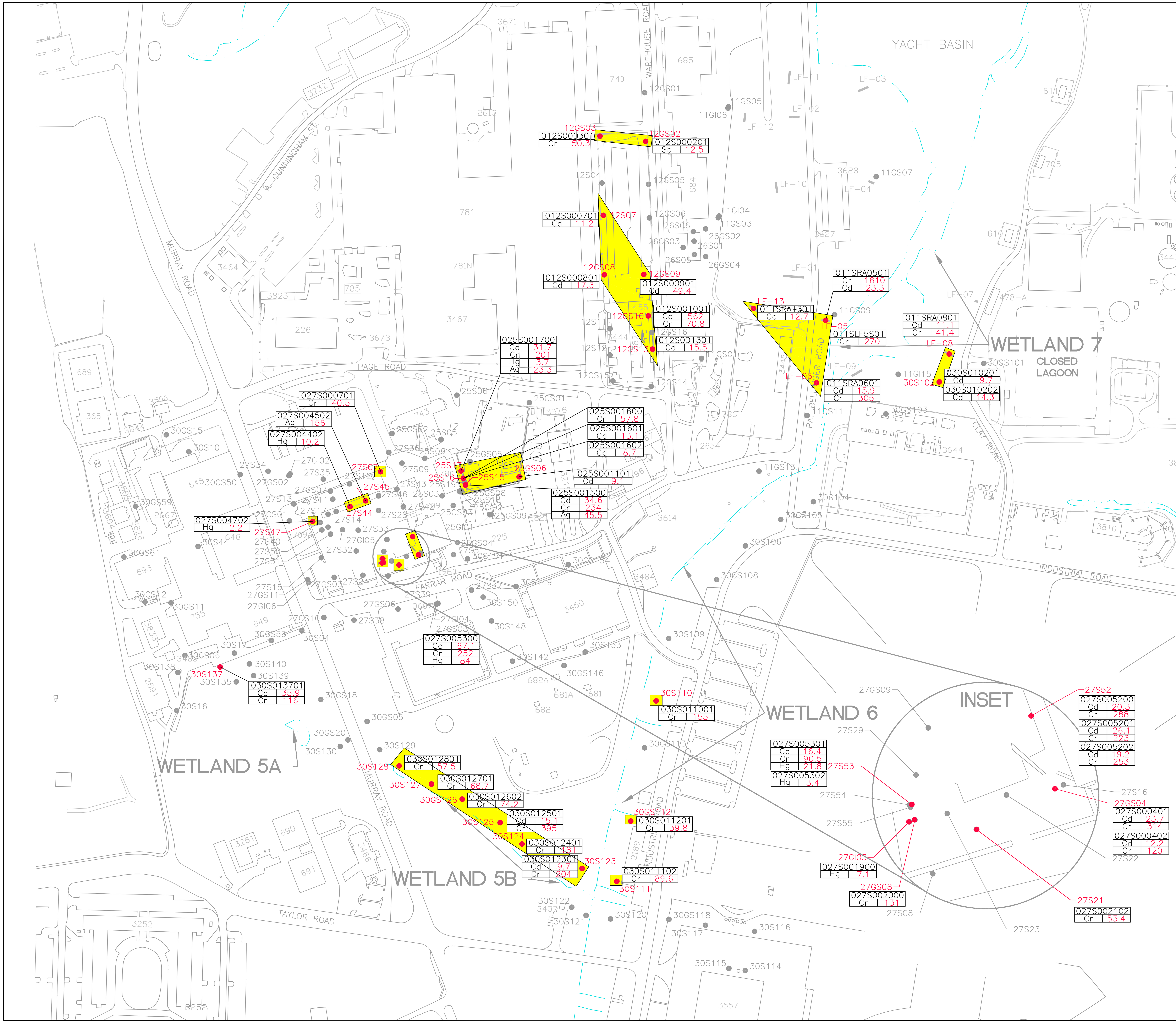
FIGURE 4-5
METALS-DIRECT C/I EXPOSURE SCTL
EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W072	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME – DEPTH IS 2 FEET
LF-12	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
30S109 ●	SURFACE SOIL BORING LOCATION EXCEEDING THE GROUNDWATER LEACHABILITY SCTL
12S12 ●	SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

METALS	FDEP Groundwater Leachability SCTL (ppm)
Cadmium (Cd)	8
Chromium (Cr)	38 (Hexavalent)
Mercury (Hg)	2.1
Silver (Ag)	17

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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FIGURE 4-6
METALS–GROUNDWATER LEACHABILITY SCTL EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W066	Of 1

LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME
LF-12	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
11GI15 ●	SUBSURFACE SOIL BORING LOCATION EXCEEDING THE GROUNDWATER LEACHABILITY SCTL
30S109 ●	SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

METALS	FDEP Groundwater Leachability SCTL (ppm)
Total Chromium	38 (Hexavalent)

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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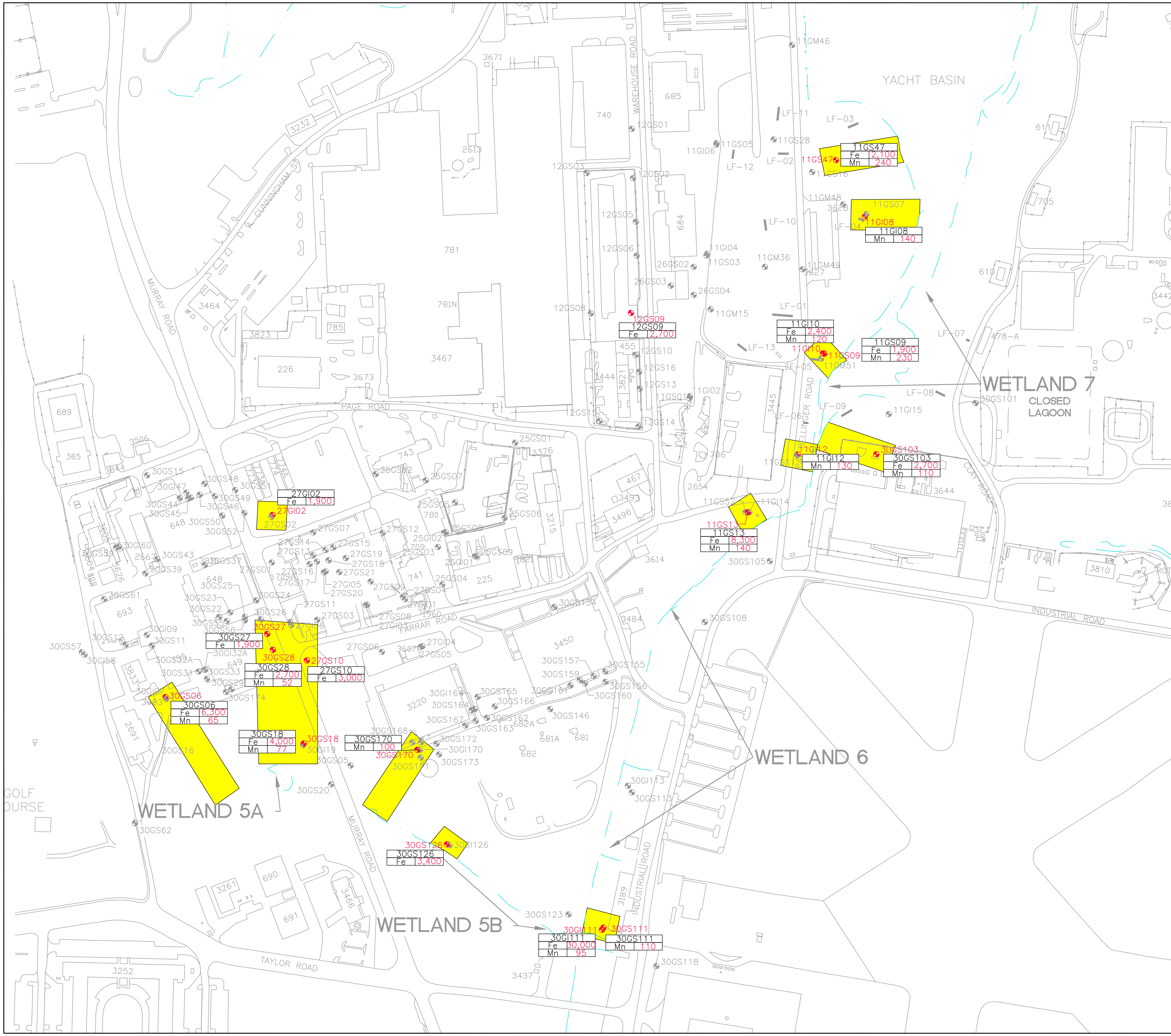
FIGURE 4-7
METALS-GROUNDWATER LEACHABILITY SCTL EXCEEDANCES IN SUBSURFACE SOIL
MARCH 2003

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W070	Of 1



LEGEND

- SURFACE WATER BODY
- 743 BUILDING
- AREA OF REMEDIAL VOLUME
- LF-10 TRENCH LOCATIONS/IDs
- FENCE LINE
- ROADS
- SIDEWALKS
- 30GS155 SHALLOW OR INTERMEDIATE MONITORING WELL
- 30GS111 SHALLOW GROUNDWATER MONITORING WELL LOCATIONS/IDs WITH SAMPLE EXCEEDING THE GROUNDWATER CTL OR REFERENCE CONCENTRATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

INORGANIC	FLORIDA GCTL (ppb)	REFERENCE CONC.
Aluminum (Al)	200	3882.80
Iron (Fe)	300	1707.80
Manganese (Mn)	50	22

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER BILLION (PPB)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE

160 0 160
SCALE FEET

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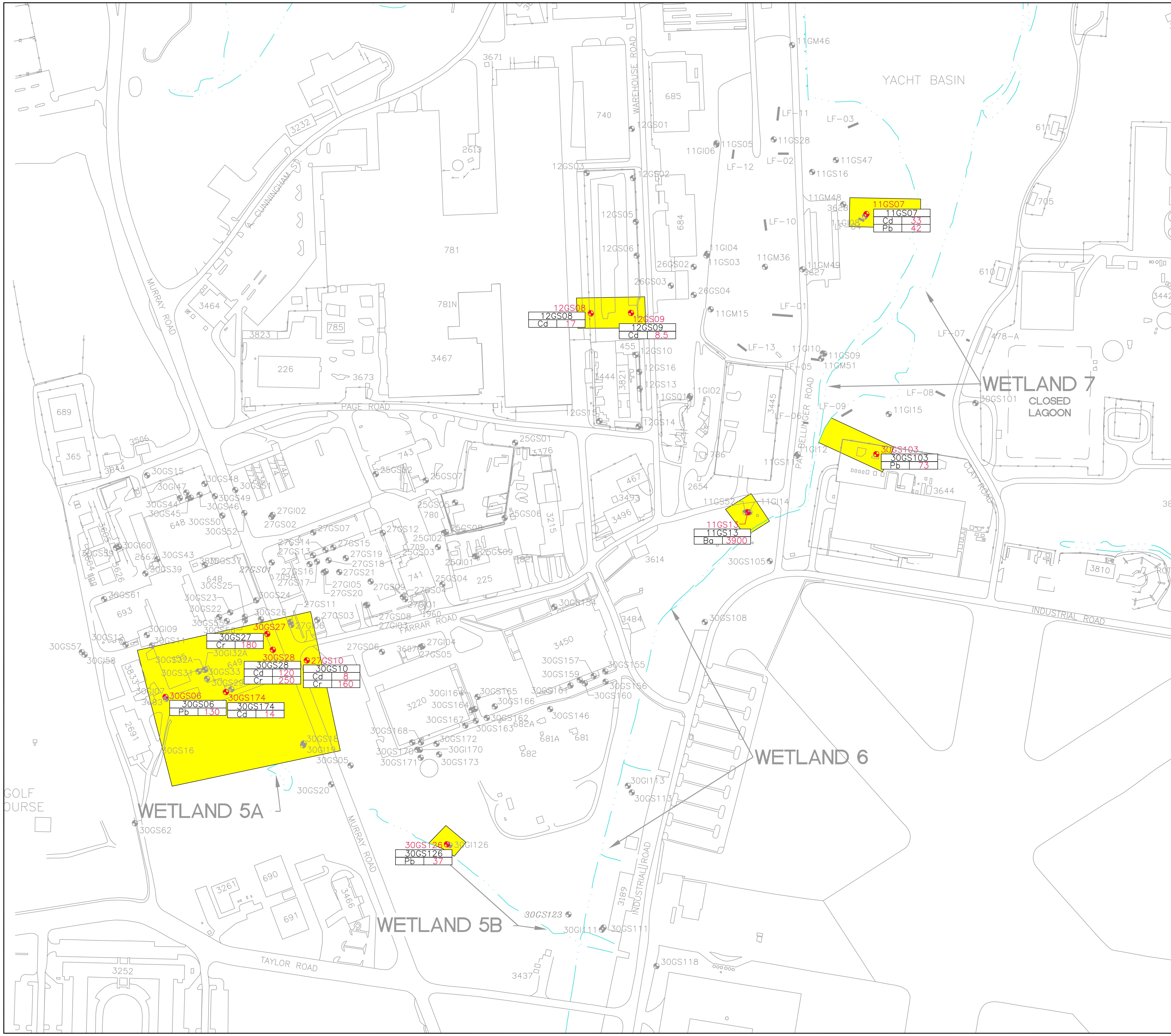
FIGURE 4-8
ALUMINUM, IRON, AND MANGANESE GCTL EXCEEDANCES AND REMEDIAL AREAS IN GROUNDWATER
MARCH 2003

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W078	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME
LF–10	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
30GS155	SHALLOW OR INTERMEDIATE MONITORING WELL
30GS111	SHALLOW GROUNDWATER MONITORING WELL LOCATIONS/IDs WITH SAMPLE EXCEEDING THE GROUNDWATER CTL

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

METALS	FLORIDA GCTL (ppb)
Barium (Ba)	2000
Cadmium (Cd)	5
Chromium (Cr)	100
Lead (Pb)	15

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER BILLION (PPB)
2. ALTHOUGH OTHER INORGANICS WERE DETECTED, IF NO GCTL EXCEEDANCES OCCURRED IN ANY OU–2 SAMPLES, THEY ARE NOT PLOTTED HERE. REFER TO THE SUMMARY TABLES FOR THESE CONSTITUENTS.
3. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE

160 0 160
SCALE FEET

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FIGURE 4–9
BARIUM, CADMIUM, CHROMIUM, AND LEAD – GCTL EXCEEDANCES AND REMEDIAL AREAS IN GROUNDWATER
MARCH 2003

Dr by: K. WOOSLEY	Proj. Code: 0059–001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W075	Of 1

LEGEND

- SURFACE WATER BODY
- 743 BUILDING
- AREA OF REMEDIAL VOLUME – DEPTH IS 2 FEET
- LF-12 TRENCH LOCATIONS/IDs
- FENCE LINE
- ROADS
- SIDEWALKS
- 11GI15 SURFACE SOIL BORING LOCATION EXCEEDING THE DIRECT RESIDENTIAL EXPOSURE SCTL
- 30S109 SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

PESTICIDE/PCBs	FDEP Residential Direct Exposure SCTL (ppm)
Aroclor-1260 (PCB1)	0.5 (PCBs-Aroclor mixture)
Aroclor-1242 (PCB2)	0.5 (PCBs-Aroclor mixture)
Aroclor-1254 (PCB3)	0.5 (PCBs-Aroclor mixture)
Dieldrin (D)	0.07

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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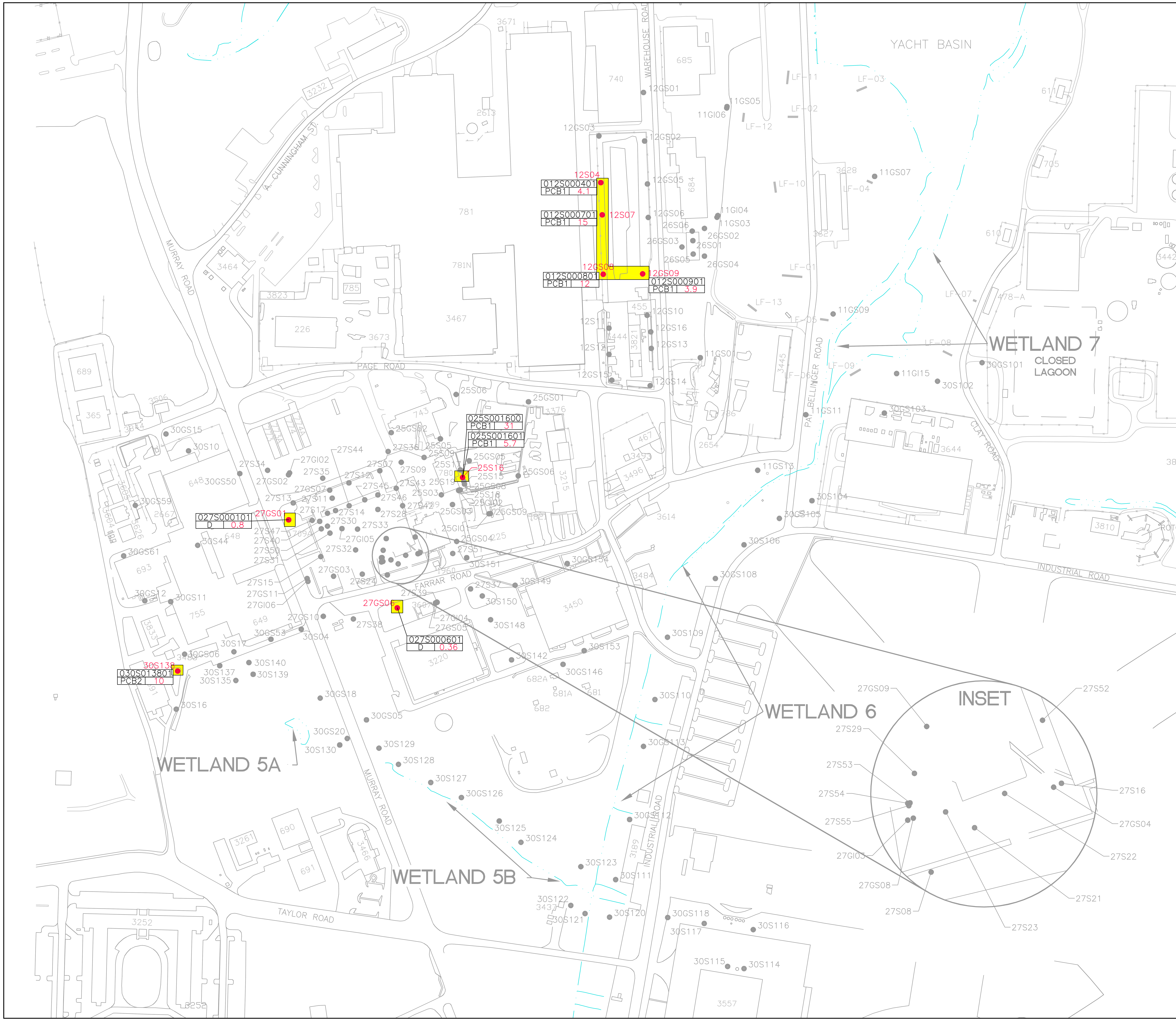
FIGURE 4-10
PESTICIDES/PCBs–RESIDENTIAL DIRECT EXPOSURE SCTL EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W081	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME
LF-12	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
27GS06 ●	SURFACE SOIL BORING LOCATION EXCEEDING THE DIRECT C/I EXPOSURE SCTL
30S109 ●	SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

PESTICIDE/PCBs	FDEP Direct C/I Exposure SCTL (ppm)
Aroclor-1260 (PCB1)	2.1 (PCBs-Aroclor mixture)
Aroclor-1242 (PCB2)	2.1 (PCBs-Aroclor mixture)
Dieldrin	0.3

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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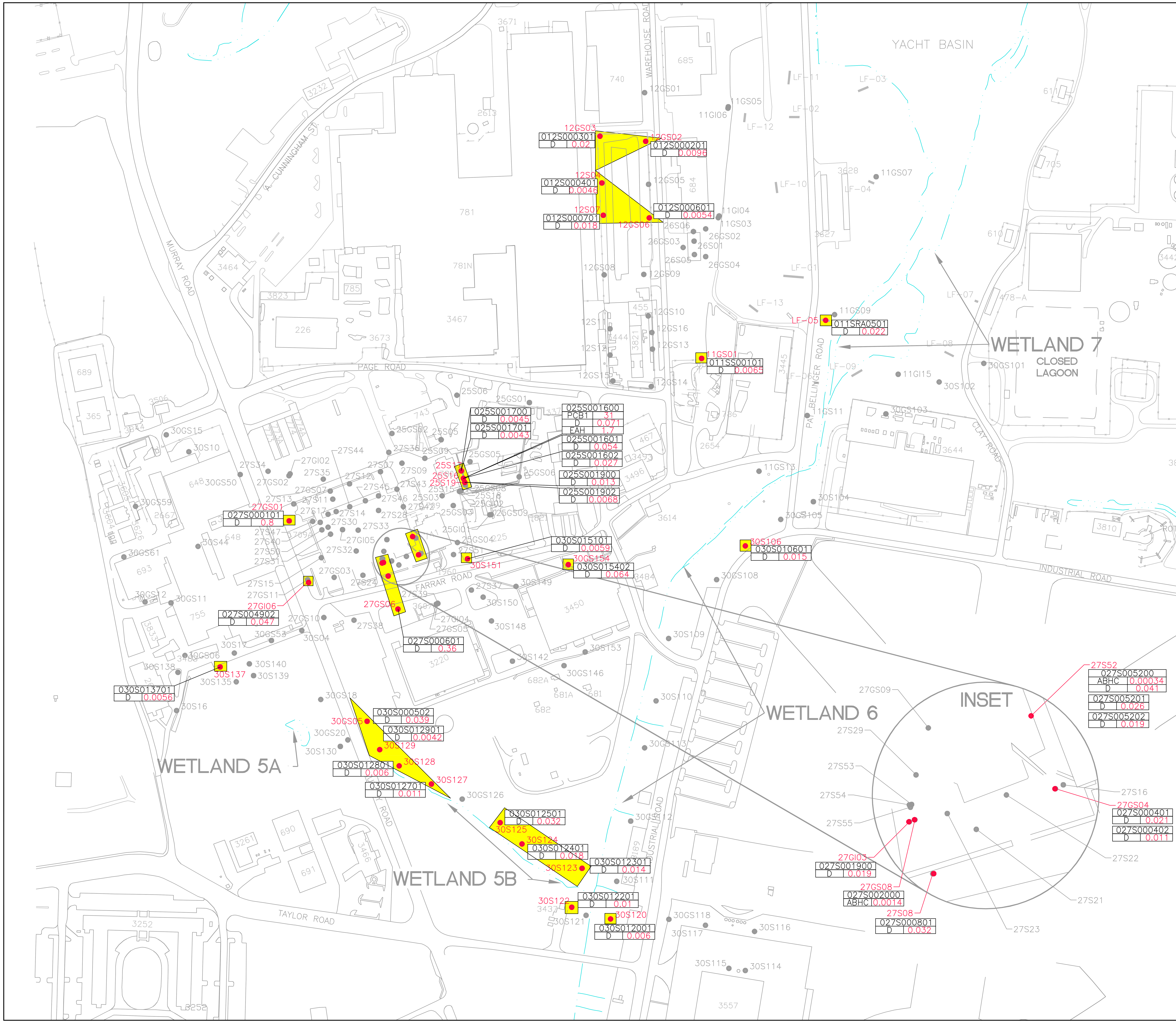
FIGURE 4-11
PESTICIDES/PCBs-DIRECT C/I EXPOSURE SCTL EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W073	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME
LF-12	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
27S52 ●	SURFACE SOIL BORING LOCATION EXCEEDING THE GROUNDWATER LEACHABILITY SCTL
30S109 ●	SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

PESTICIDE/PCBs	FDEP Groundwater Leachability SCTL (ppm)
alpha-BHC (ABHC)	0.0003
Aroclor-1260 (PCB1)	17 (PCBs Aroclor mixture)
Dieldrin (D)	0.004
Endrin aldehyde (EAH)	1 (Endrin)

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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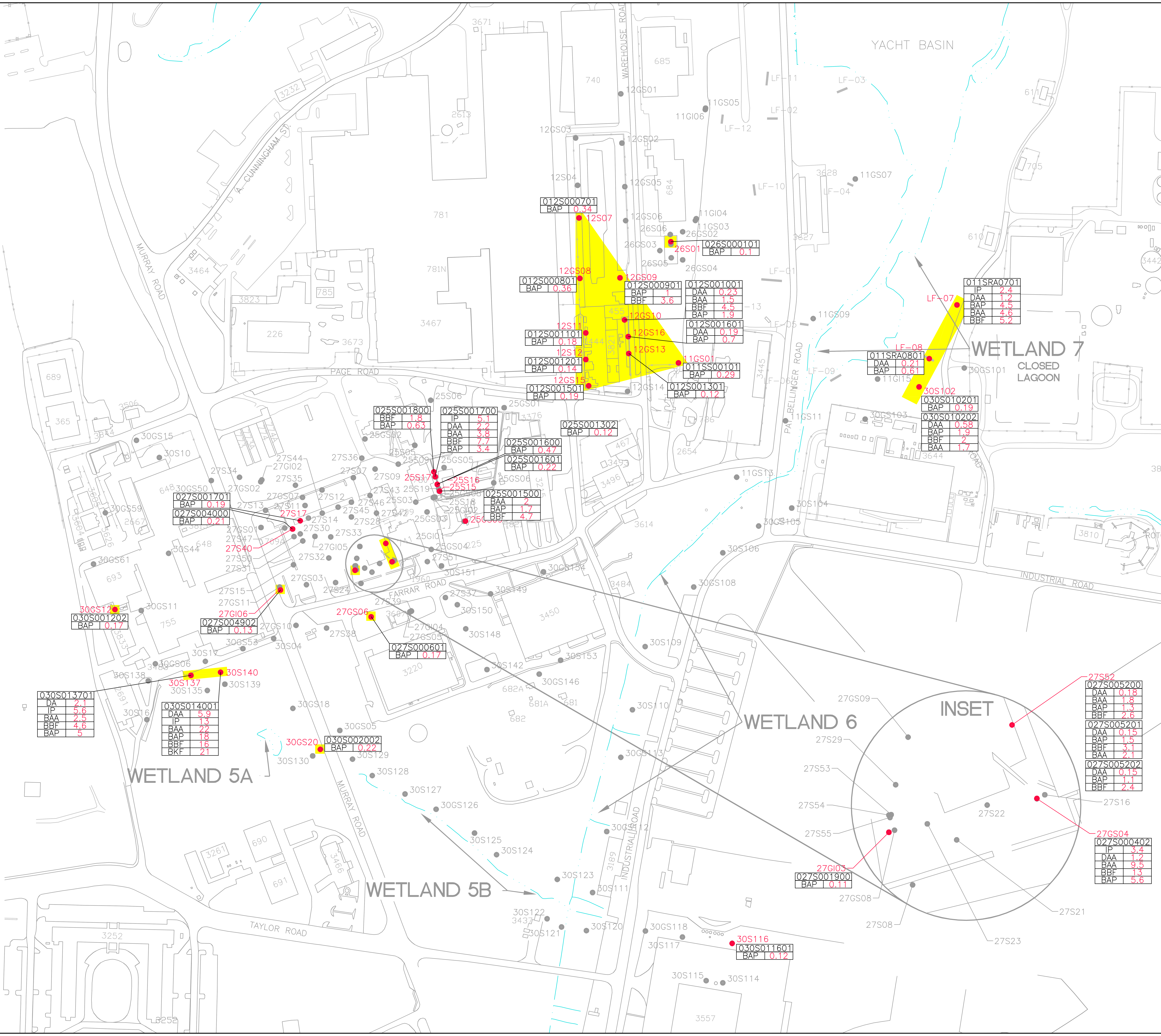
PENSACOLA, FLORIDA

FIGURE 4-12
PESTICIDES/PCBs–GROUNDWATER LEACHABILITY SCTL EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W067	Of 1



LEGEND

- SURFACE WATER BODY
- BUILDING
- AREA OF REMEDIAL VOLUME – DEPTH IS 2 FEET
- LF-12 TRENCH LOCATIONS/IDs
- FENCE LINE
- ROADS
- SIDEWALKS
- 11GI15 SURFACE SOIL BORING LOCATION EXCEEDING THE RESIDENTIAL DIRECT EXPOSURE SCTL
- 30S109 SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

SVOCs	FDEP Residential Direct Exposure SCTL (ppm)
Benzo(a)anthracene (BAA)	1.4
Benzo(a)pyrene (BAP)	0.1
Benzo(b)fluoranthene (BBF)	1.4
Benzo(k)fluoranthene (BKF)	15
Dibenz(a,h)anthracene (DAA)	0.1
Indeno(1,2,3-cd)pyrene (IP)	1.5

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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PENSACOLA, FLORIDA

FIGURE 4-13
SVOCs-RESIDENTIAL DIRECT EXPOSURE SCTL EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 22NOV04	DWG Name: 0059001W082	Of 1

LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME – DEPTH IS 2 FEET
LF-12	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
27GS06	SURFACE SOIL BORING LOCATION EXCEEDING THE DIRECT C/I EXPOSURE SCTL
30S109	SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

METALS	FDEP Direct C/I Exposure SCTL (ppm)
Benzo(a)pyrene (BAP)	0.5
Benzo(b)fluoranthene (BBF)	4.8
Dibenz(a,h)anthracene (DAA)	0.5
Indeno(1,2,3-cd)pyrene (IP)	5.3
Benzo(a)anthracene (BAA)	5

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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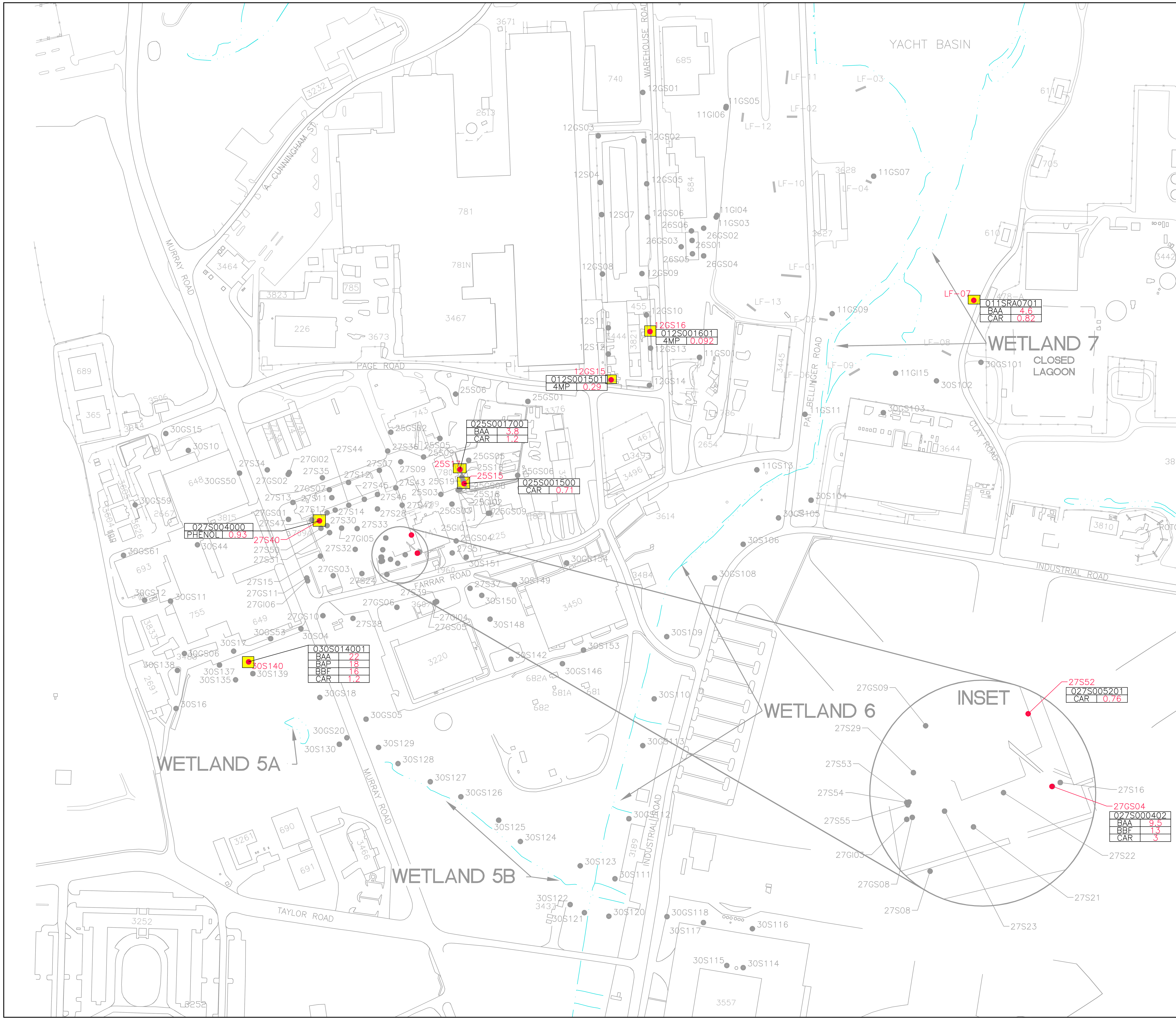
PENSACOLA, FLORIDA

FIGURE 4-14
SVOCs-DIRECT C/I EXPOSURE SCTL
EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W074	Of 1



LEGEND

- SURFACE WATER BODY
- 743 BUILDING
- AREA OF REMEDIAL VOLUME – DEPTH IS 2 FEET
- LF-12 TRENCH LOCATIONS/IDs
- FENCE LINE
- ROADS
- SIDEWALKS
- 27S52 SURFACE SOIL BORING LOCATION EXCEEDING THE GROUNDWATER LEACHABILITY SCTL
- 30S109 SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

SVOCs	FDEP Groundwater Leachability SCTL (ppm)
4–Methylphenol (p–Cresol) (4MP)	0.03
Benzo(a)anthracene (BAA)	3.2
Benzo(a)pyrene (BAP)	8
Benzo(b)fluoranthene (BBF)	10
Carbazole (CAR)	0.6
Phenol (PHENOL)	0.05

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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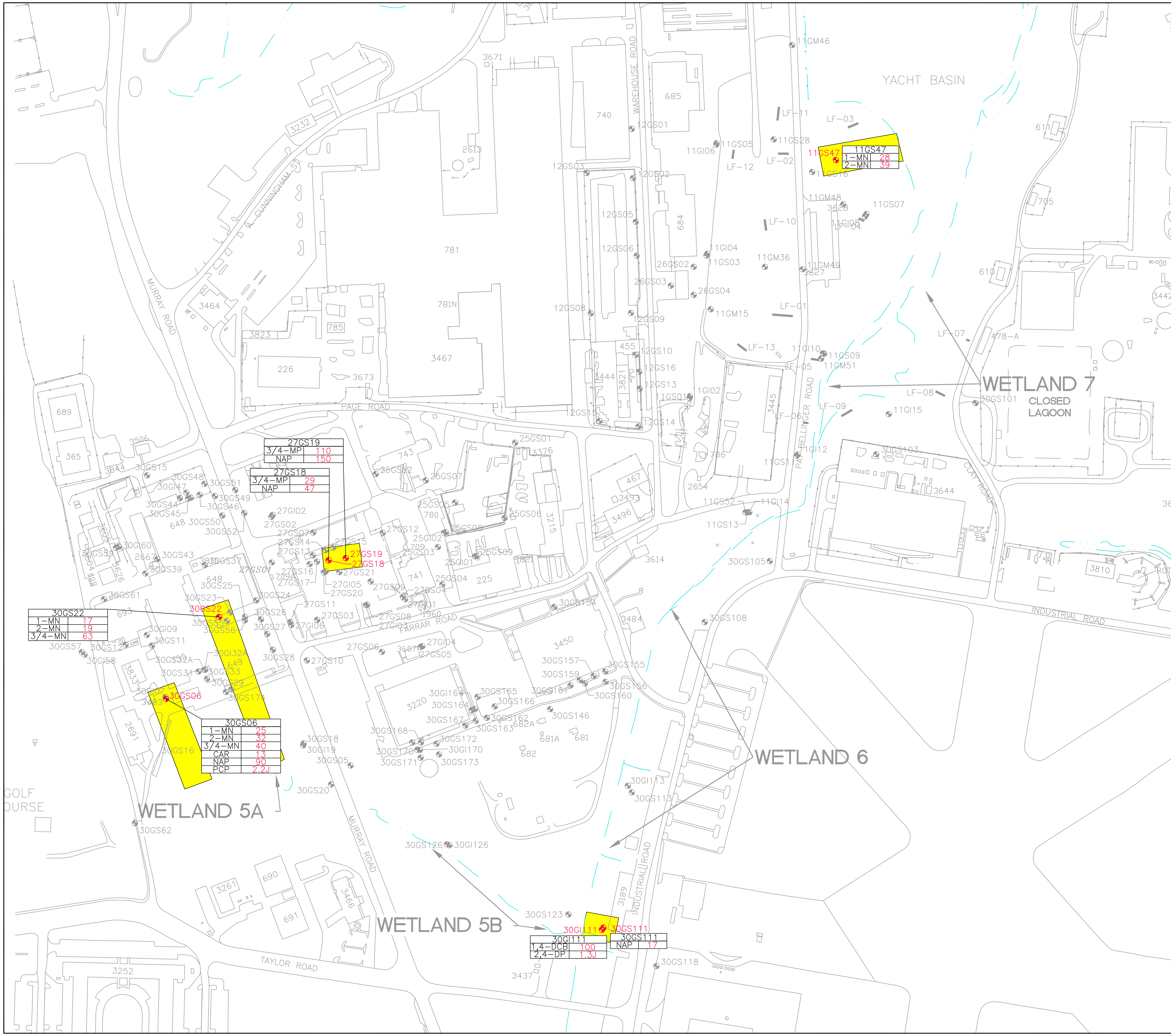
FIGURE 4–15
SVOCs–GROUNDWATER LEACHABILITY SCTL
EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059–001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W068	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME
LF-10	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
30GS155	SHALLOW OR INTERMEDIATE MONITORING WELL
30GS111	SHALLOW GROUNDWATER MONITORING WELL LOCATIONS/IDs WITH SAMPLE EXCEEDING THE GROUNDWATER CTL

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

SVOCs	FLORIDA GCTL (ppb)
1,4-Dichlorobenzene (1,4-DCB)	75
1-Methylnaphthalene (1-MN)	15
2,4-Dichlorophenol (2,4-DP)	0.3
2-Methylnaphthalene	15
3-Methylphenol/4-Methylphenol (3/4-MP)	3.8
Carbazole (CAR)	1.9
Naphthalene (NAP)	15
Pentachlorophenol (PCP)	1

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER BILLION (PPB)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE

160 0 160
SCALE FEET

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FIGURE 4-16
SVOCs-GCTL EXCEEDANCES AND REMEDIAL AREAS IN GROUNDWATER
MARCH 2003

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W076	Of 1

LEGEND

- SURFACE WATER BODY
- 743 BUILDING
- AREA OF REMEDIAL VOLUME – DEPTH IS 2 FEET
- LF-12 TRENCH LOCATIONS/IDs
- FENCE LINE
- ROADS
- SIDEWALKS
- 27S52 ● SURFACE SOIL BORING LOCATION EXCEEDING THE GROUNDWATER LEACHABILITY SCTL
- 30S109 ● SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

VOCs	FDEP Groundwater Leachability SCTL (ppm)
Methylene Chloride (MC)	0.02
1,2-Dichloroethane (1,2-DCA)	0.01

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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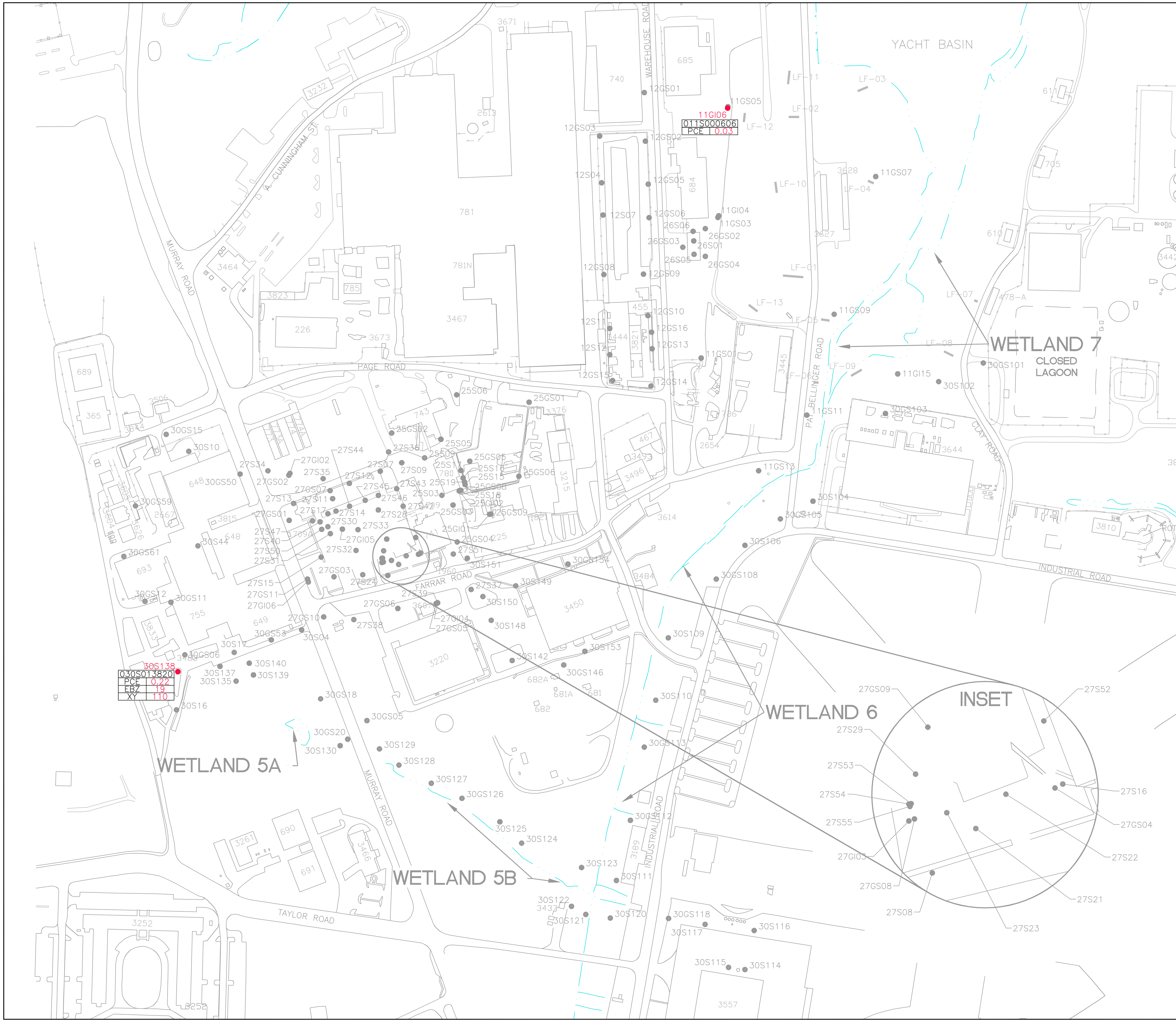
FIGURE 4-17
VOCs-GROUNDWATER LEACHABILITY SCTL
EXCEEDANCES AND REMEDIAL AREAS IN SURFACE SOIL

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W069	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
LF-12	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
11GI15 ●	SUBSURFACE SOIL BORING LOCATION EXCEEDING THE GROUNDWATER LEACHABILITY SCTL
30S109 ●	SOIL BORING LOCATION

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

VOCs	FDEP Groundwater Leachability SCTL (ppm)
Tetrachloroethene (PCE)	0.03
Ethylbenzene (EBZ)	0.6
Xylene (XY)	0.2

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER MILLION (PPM)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   S = SOIL BORING SAMPLE
   GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   SRA/SLF = TRENCH SOIL SAMPLE
3. LAST TWO DIGITS OF SAMPLE ID INDICATE SAMPLE DEPTH

160 0 160
SCALE FEET

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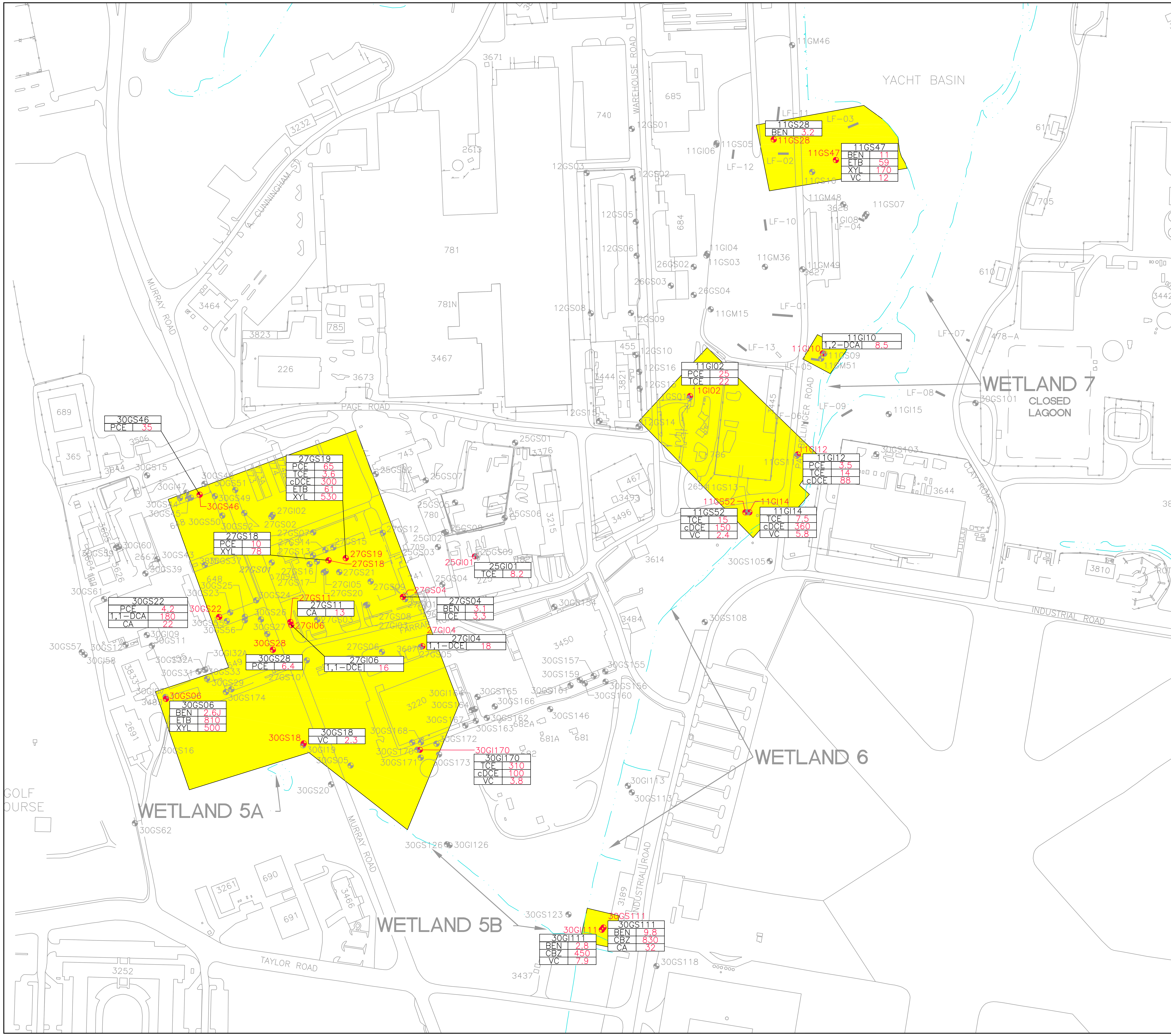
FIGURE 4-18
VOCs-GROUNDWATER LEACHABILITY SCTL
EXCEEDANCES AND REMEDIAL AREAS IN SUBSURFACE SOIL
MARCH 2003

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W071	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
	AREA OF REMEDIAL VOLUME
LF-10	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
30GS155	SHALLOW OR INTERMEDIATE MONITORING WELL
30GS111	SHALLOW GROUNDWATER MONITORING WELL LOCATIONS/IDs WITH SAMPLE EXCEEDING THE GROUNDWATER CTL
SAMPLE ID / PARAMETER KEY / CONCENTRATION	

PARAMETER KEY

VOC	FLORIDA GCTL (ppb)
Benzene (BEN)	1
Chlorobenzene (CBZ)	100
Chloroethane (CA)	13
1,1-Dichloroethane (1,1-DCA)	76
1,2-Dichloroethane (1,2-DCA)	3
1,1-Dichloroethene (1,1-DCE)	7
cis-1,2-Dichloroethene (cDCE)	70
Ethylbenzene (ETB)	30
Tetrachloroethene (PCE)	3
Trichloroethene (TCE)	3
Vinyl Chloride (VC)	1
Xylenes [Total] (XYL)	20

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER BILLION (PPB)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   - S = SOIL BORING SAMPLE
   - GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - GI = INTERMEDIATE GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   - SRA/SLF = TRENCH SOIL SAMPLE

160 0 160
SCALE FEET

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FIGURE 4-19
VOCs-GCTL EXCEEDANCES AND REMEDIAL AREAS IN GROUNDWATER
MARCH 2003

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W077	Of 1

LEGEND

	SURFACE WATER BODY
743	BUILDING
LF-10	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
30GS155	SHALLOW OR INTERMEDIATE MONITORING WELL
30GS111	SHALLOW GROUNDWATER MONITORING WELL LOCATIONS/IDs WITH SAMPLE EXCEEDING THE GROUNDWATER CTL

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

PARAMETERS	FSWCTL	MSWCTL	NASP GROUNDWATER REFERENCE
Aluminum	13	13	3882
Cadmium	9.3	9.3	3.40
Iron	1000	300	1707
Lead	8.5	8.5	1.60
Copper	3.7	2.9	16.20
Zinc	86	86	153.2
2-Methylnapthalene (2-MN)	30	30	NA
Anthracene (ANTH)	0.3	0.3	NA
Fluoranthene (FLUOR)	0.3	0.3	NA
Napthalene (NAP)	26	26	NA
Pyrene (PYR)	0.3	0.3	NA
1,4 Dichlorobenzene (1,4DCB)	3.3	3.3	NA
Chlorobenzene (CBZ)	17	17	NA
Tetrachloroethene (PCE)	8.85	8.85	NA
Ethylbenzene (EBZ)	610	610	NA
Xylenes (XY)	370	370	NA
Vinyl Chloride (VC)	2.6	2.6	NA

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER BILLION (PPB)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:

FSWCTL = FRESH SURFACE WATER CLEANUP TARGET LEVEL
MSWCTL = MARINE SURFACE WATER CLEANUP TARGET LEVEL
NA = NOT APPLICABLE

160 0 160
SCALE FEET

Naval Facilities Engineering Command
SOUTHERN DIVISION

FEASIBILITY STUDY
OPERABLE UNIT 2
NAS PENSACOLA
PENSACOLA, FLORIDA

FIGURE 4-20
SURFACE WATER CRITERIA EXCEEDANCES IN DOWNGRADIENT GROUNDWATER LOCATIONS
MARCH 2003

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001B046	Of 1

5.0 TECHNOLOGY SCREENING

This section describes the identification and screening of applicable remedial technologies. Once identified, the technologies are qualitatively evaluated for effectiveness, implementability, and cost. The identified remedial technologies are subsequently eliminated from, or retained for, further consideration.

5.1 Identification and Evaluation of Remedial Technologies

Remedial technologies were identified from the *Remediation Technologies Screening Matrix and Reference Guide, Fourth Edition* (Van Deuren et al., 2002). This screening matrix provided a basis for the identification of remedial technologies, as some technologies were added and others discounted. The technology screening matrix facilitated the identification of in situ biological and physical/chemical soil treatment technologies; ex situ biological, physical/chemical, and thermal soil treatment technologies; containment and other technologies for soil; in situ biological and physical/chemical groundwater treatment technologies; ex situ biological and physical/ chemical groundwater treatment technologies; and groundwater containment technologies. The screening matrix provides qualitative estimates of the technology's availability, suitability for different types of contaminants, relative overall cost, and whether the technology is capital or O&M cost intensive. Technology descriptions are also given in this documentation.

In Tables 5-1 and 5-2, the identified soil and groundwater technologies are briefly described and qualitatively evaluated for OU 2 based on the implementability, effectiveness, and cost criteria. These tables are consistent with technology screening techniques presented in the NCP and USEPA guidance because they include containment, removal, disposal, and treatment options.

Table 5-1
Soil Technology Screening for Operable Unit 2

Technology	Description	Implementability	Effectiveness	Cost
In situ Biological Treatment				
Bioventing	Air is either extracted from or injected into the unsaturated soils to increase oxygen concentrations and stimulate biological activity. Bioventing is applicable for any contaminant that more readily degrades aerobically than anaerobically. This process is used to deliver amendments to zones deeper than can be managed by bioremediation practices alone. Flow rates are much lower than soil vapor extraction, minimizing volatilization and release of contaminants to the atmosphere. Where preferential pathways exist in the vadose zone, air flow may not reach all contaminated media.	Bioventing would require the construction of wells and surface trenches for associated piping. O&M equipment would need to be maintained. Bioventing would need to be coordinated with radioactive soil remediation plans.	Bioventing is generally not applicable for the remediation of shallow soils. The high water table and permeable cover may preclude its use. Not effective for metals and trichloroethene. For amenable contaminants, bioventing is unlikely to be more effective than natural degradation processes at this site, given that surface soil is already highly oxygenated.	Bioventing is relatively inexpensive, though ongoing use of blowers and ancillary piping will require O&M. A high spatial resolution under permeable cover may make bioventing relatively expensive.
Enhanced Bioremediation	Indigenous aerobic and/or anaerobic microbes are stimulated by amending contaminated soils with substrate, nutrients, oxygen, and water to enhance biodegradation. Bioaugmentation is also possible. Amendments may be applied through irrigation or mechanical means such as tillers or rippers. Effectiveness is limited at depth for mechanical mixing. Effectiveness may be limited if deeper zones exhibit preferential pathways and amendment delivery is irregular.	May limit land use. Equipment access (for mechanical mixing) may be limited in areas. Bioremediation near Wetlands 7 and 64 would require floodplain compliance. Bioremediation would need to be coordinated with radioactive soil remediation plans.	Generally only effective for contaminated soil at less than 2-foot depth, which can be amended by mechanical means. The homogeneity of the sandy soils may facilitate uniform amendment delivery, however. Non-halogenated SVOCs and VOCs may be readily bioremediated, although degradation rates are slower for SVOCs. Bioremediation may be limited in sandy soils because of natural carbon concentrations, but is unlikely to be restricted by other environmental factors.	Bioremediation costs are typically variable because the need for amendments is highly site specific. However, in situ bioremediation costs are typically lower than other in situ technologies such as SVE.

Table 5-1
Soil Technology Screening for Operable Unit 2

Technology	Description	Implementability	Effectiveness	Cost
Phyto-remediation	Phytoremediation is the use of plants to remove, contain, and/or degrade contaminants. Examples include: enhanced rhizosphere biodegradation, phytoaccumulation, phytodegradation, and phytostabilization. Climatic or hydrologic conditions may restrict the rate of growth of the remediation plants.	Current and future site use may make phytoremediation may preclude its implementation. Impacted areas posing risk are currently used for parking and access to adjacent buildings. Phytoremediation would eliminate the use of these areas. Phytoremediation would need to be coordinated with radioactive soil remediation plans.	Phytoremediation is an innovative technology that may be effective for shallow contamination, within the root zones of plants. Shallow contamination is easily monitored and controlled. Although high concentrations of hazardous materials can be toxic to plants, contaminant concentrations at OU 2 are not excessive. Although phytoremediation is a treatment technology, it is also an immobilization and containment technology. Because of plant mortality, the immobilization and containment mechanisms may be reversible.	Costs for phytoremediation are expected to be low compared with other in situ techniques. Maintenance costs are also expected to be relatively low, consisting of monitoring, watering costs, and plant replacement.
In situ Physical/Chemical Treatment				
In situ Solidification/ Stabilization (S/S)	In situ S/S immobilizes contaminants by mixing site soil with Portland cement, lime, or a chemical reagent to reduce the mobility of the contaminant. Large augering equipment is used for in-place mixing of soils with the reagent. This technology will likely leave a solid mass (similar to concrete) onsite.	In situ S/S is technically implementable at OU 2. The addition of amendments would increase the soil volume and result in some mounding. The stabilized mass may be left in place, and use of the area for parking and access may continue. S/S would need to be coordinated with radioactive soil remediation plans.	In situ S/S can be an effective containment strategy for PAH compounds. However, this technology works better for inorganics including radionuclides. Some organic-contaminated soils may delay or inhibit reactions necessary for solidification. Long-term, the stabilized mass can degrade, particularly if subject to repeated abuse. S/S is not a permanent treatment technology and does not remove or destroy contaminants; rather, contaminants are immobilized. Treated media typically must be managed long term (e.g., through institutional controls and monitoring).	In situ S/S costs typically vary given the stabilizing material required (e.g., fly ash, Portland cement, etc.). The shallow depths of contaminated soil may facilitate less expensive construction methods.

Table 5-1
Soil Technology Screening for Operable Unit 2

Technology	Description	Implementability	Effectiveness	Cost
Ex situ Biological Treatment (Assuming Excavation)				
Solid Phase Bioremediation	Excavated soils are mixed with amendments, nutrients, enzymes, or fillers and placed in aboveground enclosures. Mixing may be required, as in a traditional landfarming application. Conversely, biopiles may be used simply to deliver oxygen uniformly throughout a large pile. Ex situ biological systems may be designed to degrade specific compounds and maintain specified degradation conditions (aerobic vs. anaerobic). Mechanical mixing such as tilling or turning of windrows may be required.	Existing structures and utilities may impede or restrict excavation. Landfarming may have large space requirements, precluding its use. Any ex situ remedial action would need to be coordinated with radioactive soil remediation plans.	Ex situ bioremediation systems may be tailored to the specific contaminant requiring treatment. Bioremediation is typically limited to organic compounds. Heavy metals may be toxic to microorganisms. Bioremediation half-lives for PAHs and PCBs may be longer than more degradable compounds such as BTEX, which may extend the remediation time frame.	Ex situ solid phase bioremediation is inexpensive compared with other ex situ techniques. However, given the need to design specific nutrient amendments and process control systems, more recalcitrant organics are typically more expensive to treat.
Slurry Phase Biological Treatment	Slurry-phase bioreactors containing co-metabolites and specially adapted microorganisms can be used to treat halogenated VOCs and SVOCs, pesticides, and PCBs. An aqueous slurry is created by combining soil with water and other additives. The slurry is mixed continuously to keep solids suspended and microorganisms in contact with the soil contaminants. Upon completion of the process, the slurry is dewatered and the treated soil is disposed.	Existing structures and utilities may impede or restrict excavation. Moreover, a large amount of space is required for slurry phase ex situ bioremediation. Any ex situ remedial action would need to be coordinated with radioactive soil remediation plans.	Slurry-phase bioreactors are used primarily to treat nonhalogenated SVOCs and VOCs in excavated soils or dredged sediments. Ex situ bioremediation systems may be tailored to the specific contaminant requiring treatment. Biodegradation is typically limited to organic compounds, and heavy metals may be toxic to microorganisms. Remediation half-lives for PAHs may be slower than more degradable compounds such as BTEX, which may extend the remediation time frame.	Ex situ slurry phase bioremediation is expensive compared with other biological techniques, due to the controls and materials handling required.

Table 5-1
Soil Technology Screening for Operable Unit 2

Technology	Description	Implementability	Effectiveness	Cost
Ex situ Physical/Chemical Treatment (Assuming Excavation)				
Chemical/ Physical Oxidation (permangan-ate flooding, Fenton's reagent, wet air oxidation, supercritical water oxidation)	Chemical oxidation is a process in which the oxidation state of a contaminant is increased while the oxidation state of the reactant is decreased. The reactant can be another element, including the oxygen molecule, or it may be a chemical species containing oxygen such as hydrogen peroxide or chlorine dioxide. In the case of physical oxidation technologies, wet air oxidation and supercritical water oxidation both use high pressure and temperature to treat organic contaminants.	Existing structures and utilities may impede or restrict excavation. Moreover, a large amount of space is required for ex situ chemical/physical oxidation bioremediation. Any ex situ remedial action would need to be coordinated with radioactive soil remediation plans.	This technology is effective in treating media contaminated with halogenated and non-halogenated SVOCs and VOCs, PCBs, pesticides, cyanides, and volatile and nonvolatile metals. Wet air oxidation can treat hydrocarbons and other organic compounds. Supercritical water oxidation is applicable for PCBs and other stable compounds.	Costs for chemical oxidation processes may be comparable to soil washing costs, given the need to construct and operate ex situ reactors, and the need to control reagents and reactor conditions. Costs may vary widely with the type of oxidation technique implemented.
Soil Washing (Chemical, Acid, and Solvent Extraction and Separation Techniques)	Excavated soil is washed with aqueous-based solutions to separate contaminants sorbed onto fine particles from the rest of the soil matrix. The fractions of soil to be treated are processed in a slurry with specific leachant mixtures to ionize target metals. The solvent/waste mixture is then treated further to develop a concentrated leaching solution which may be treated or disposed offsite. Traditional soil washing options may also include separation techniques that concentrate contaminated solids through physical and chemical means. These processes seek to detach contaminants from their medium (e.g., soil, sand, or other binding material). Gravity separation, magnetic separation, and sieving/physical separation are examples of this technology.	Existing structures and utilities may impede or restrict excavation. Soil washing systems will require operational space as well as possible water and sewer connections. Any ex situ remedial action would need to be coordinated with radioactive soil remediation plans.	Overall, this technology is effective at removing SVOCs and inorganics. It is less effective at treating VOCs. In general, acid extraction techniques are suitable for treating soils contaminated by heavy metals. Solvent extraction has been shown to be effective in treating soils containing primarily organic contaminants, but is generally least effective on very high molecular-weight organic and very hydrophilic substances. Soils with higher clay content may reduce extraction efficiency and require longer contact times. High humic content in soil may require pretreatment. It may be difficult to remove organics adsorbed to clay-size particles. Soil washing is a permanent treatment technology that removes contaminants from soil to another medium (e.g., solvent, carbon, etc.). Treatment residuals then may require treatment or disposal. Soil washing solvents may also pose environmental risks.	Soil washing is typically an expensive remediation alternative because of the highly site-specific design requirements and the need to treat and/or dispose of the leaching solvent. Magnetic separation is specifically used on heavy metals, radionuclides, and magnetic radioactive particles such as uranium and plutonium compounds.

Table 5-1
Soil Technology Screening for Operable Unit 2

Technology	Description	Implementability	Effectiveness	Cost
Ex situ Solidification/ Stabilization (S/S)	Contaminants are physically bound or encased within a stabilized mass, or chemical reactions are induced with stabilizing agents. The contaminants are not removed or destroyed, but their mobility is reduced. Examples of S/S technologies include: bituminization, emulsified asphalt, modified sulfur cement, polyethylene extrusion, pozzolan/Portland cement, radioactive waste solidification, sludge stabilization, and soluble phosphates.	Existing structures and utilities may impede or restrict excavation. Moreover, a large amount of space is required for ex situ S/S. Any ex situ remedial action would need to be coordinated with radioactive soil remediation plans.	Ex situ S/S is the best demonstrated technology for multiple compounds. This technology works well for inorganics including radionuclides. Although organic-contaminated soil may be treated with solidification/stabilization, some organics can delay or inhibit reactions necessary for solidification. S/S is not a permanent treatment technology and does not remove or destroy contaminants; rather, contaminants are immobilized. Treated media typically must be managed appropriately, i.e., landfilled or contained onsite. Where used as asphalt or similar covers, degradation due to normal asphalt weathering should be considered.	Ex situ S/S costs typically vary given the stabilizing material required (e.g., fly ash, Portland cement, etc.). However, ex situ S/S is relatively inexpensive, compared with other ex situ technologies.
Ex situ Thermal Treatment (Assuming Excavation)				
Incineration/ Pyrolysis	Incineration burns contaminated soil at high temperatures (1,600 - 2,200°F) to volatilize and combust organic contaminants. A combustion gas treatment system must be included with the incinerator. The circulating bed combustor, fluidized bed reactor, infrared combustor, and rotary kiln are several types of incinerators. Pyrolysis chemically changes contaminated soil by heating it in the absence of air. Pyrolysis can be achieved by limiting oxygen to rotary kilns and fluidized bed reactors. Molten salt destruction is another example of pyrolysis.	Existing structures and utilities may impede or restrict excavation. Offsite incineration and/or pyrolysis is the most practicable means of remedy. Soils would need to be dried to decrease moisture content to below 1%. The offsite treated soils would be disposed as nonhazardous waste. Any ex situ remedial action would need to be coordinated with radioactive soil remediation plans.	Incineration may be effective in treating organic-contaminated soil but not for soil with metals as the primary contaminants. The target contaminant groups for pyrolysis are SVOCs and pesticides. Pyrolysis is not effective in either destroying or physically separating inorganics from the contaminated medium. Volatile metals may be removed by the higher temperatures, but are not destroyed.	Incineration and pyrolysis are typically very expensive remedial options compared with other ex situ technologies.

Table 5-1
Soil Technology Screening for Operable Unit 2

Technology	Description	Implementability	Effectiveness	Cost
Thermal Desorption	Soil is heated to 200 - 1,000°F to separate VOCs, water, and some SVOCs from the solids into a gas stream. The applied temperature is dependent on the volatility of the contaminants. The organics in the gas stream must be treated or captured.	Existing structures and utilities may impede or restrict excavation. Thermal desorption may be conducted onsite and vendors are readily available. Some thermal desorbers may be regulated as incinerators, depending on construction. Testing and optimization would be required. Treated soil may be returned to place of origin. Any ex situ remedial action would need to be coordinated with radioactive soil remediation plans.	Thermal desorption units are primarily effective at removing organic contaminants. Residence time and temperature inside the unit can be varied to volatilize recalcitrant organics. Inorganic contaminants or metals that are not particularly volatile will not be effectively removed by thermal desorption. Vapor phase organics must be concentrated and treated or otherwise disposed.	Although less expensive than other ex situ thermal treatment methods, thermal desorption is still comparatively expensive. Costs increase with the degree of materials handling, pre-and post-treatment, and off-gas controls required.
Containment				
Surface Cap	Capping is a containment technology that limits direct human exposure and reduces the infiltration of precipitation and leaching of soil contamination. Capping materials include soil, asphalt, and concrete.	Soil contamination is adjacent to roadways and parking lots and could be readily paved. Utility re-routing may be required under capped areas. Capping near Wetlands 7 and 64 would require floodplain compliance. Capping would need to be coordinated with radioactive soil remediation plans.	Surface caps eliminate the direct exposure pathway and limit infiltration, which reduces the leachate exposure pathway. With ongoing maintenance, the long-term effectiveness of a cap is high. Although capping is an effective means of eliminating risk pathways and limiting contaminant mobility, it does not meet the preference for treatment, nor does it reduce contaminant toxicity or volume.	Costs vary based on cap design. When only direct exposure exceedances are observed, the cap need only eliminate the direct exposure. When leachate CTL exceedances are observed, the cap should be designed to sufficiently reduce infiltration. Costs for common capping material such as soil, asphalt, or concrete are comparatively low. Maintenance costs are

Table 5-1
Soil Technology Screening for Operable Unit 2

Technology	Description	Implementability	Effectiveness	Cost
				also low.
Other Treatment Technologies				
Excavation and Offsite Disposal	Contaminated soil is excavated and disposed offsite at a licensed waste disposal facility.	Existing structures and utilities may impede or restrict excavation. The excavated areas would be backfilled with clean fill with minimal impact to operations at adjacent buildings. Any ex situ remedial action would need to be coordinated with radioactive soil remediation plans.	Excavation with offsite disposal is expected to be an effective remediation option for all contaminants because the risk pathway is eliminated.	Costs for excavation and offsite disposal vary, depending on whether waste is classified as hazardous. If contaminant concentrations exceed 10 times universal treatment standards (UTS), soils may require ex situ treatment prior to disposal.

Notes:

BTEX	=	benzene, toluene, ethylbenzene, and xylene
CTL	=	cleanup target level
O&M	=	operation and maintenance
PAH	=	polynuclear aromatic hydrocarbons
PCB	=	polychlorinated biphenyl
SVE	=	soil vapor extraction
SVOC	=	semivolatile organic compound
UTS	=	universal treatment standard
VOC	=	volatile organic compound

Table 5-2
Groundwater Technology Screening for Operable Unit 2

Technology	Objectives	Implementability	Effectiveness	Cost
In situ Biological Treatment				
Enhanced Bioremediation	Indigenous microbes are stimulated by circulating amended groundwater through contaminated groundwater to enhance biodegradation. Amendments may include nutrients, carbon sources, and oxidants. Biostimulation can induce aerobic or anaerobic conditions. Bioaugmentation is possible.	Technology may require pilot testing to gauge effectiveness and to scale remedy.	In situ bioremediation most readily treats non-halogenated VOCs and SVOCs but can be applied for halogenated VOCs and SVOCs. Although anaerobic bioremediation may be applied for Cr(VI), it is generally ineffective for inorganics.	In situ bioremediation is generally less expensive than other in situ treatment technologies.
Monitored Natural Attenuation (MNA)	The effectiveness of natural attenuation processes are monitored to determine whether RGs can be achieved naturally.	MNA may be implementable in lower-risk groundwater at OU 2, which is sufficiently distant from surface water receptors.	Natural attenuation processes may include dilution, dispersion, volatilization, stabilization, degradation, and sorption. Because metals, VOCs, and SVOCs exceeded surface waters CTLs in monitoring wells adjacent to Wetlands 5A, 6, and 7, MNA is not a viable technology for OU 2.	MNA costs are predominantly associated with monitoring but may include capital costs for monitoring well construction. If feasible, MNA has a lower cost than other treatment options.
Phyto-remediation	Plants are used to remove, contain, and/or degrade contaminants in groundwater. Groundwater phytoremediation includes processes rhizofiltration, phytotransformation, and phytostimulation. Deep-rooted trees may be capable of hydraulically capturing groundwater in lower permeability areas adjacent to surface water.	A treatability study is required prior to full-scale implementation. Plant species are selected based on the 1) groundwater evapotranspiration potential, 2) ability to produce degradative enzymes, 3) contaminant bioaccumulation rate, 4) depth of the root zone, and 5) ability to adapt to the specific climate.	Phytoremediation may be capable of treating a wide range of contaminants, including petroleum hydrocarbons, chlorinated solvents, pesticides, metals, radionuclides, explosives, and excess nutrients. Because it is an emerging technology, limited data are available to evaluate its overall effectiveness. Contamination is reduced over a long period of time (years). Limited to shallow groundwater.	Phytoremediation costs are relatively low compared to other in situ technologies. Maintenance costs are relatively low and consist of monitoring, watering, and horticulture costs.

Table 5-2
Groundwater Technology Screening for Operable Unit 2

Technology	Objectives	Implementability	Effectiveness	Cost
In situ Physical/Chemical Treatment				
Air Sparging/ Soil Vapor Extraction (SVE)	Volatile contaminants are removed from groundwater by increasing the air flow through the saturated or vadose zone. Air may be sparged into the saturated zone and may be captured in the vadose zone through SVE. Bioventing is similar technology, where sufficient air is supplied to stimulated indigenous aerobic microbes.	Air sparging is generally accompanied by SVE, especially under foundations and covered surfaces. SVE air emissions must be permitted and may require treatment.	Although effective for VOCs, air sparging and SVE do not treat SVOCs and inorganics. Because of the permeable soil and high water table, SVE would have limited effectiveness under pervious cover.	Air sparging capital and O&M costs are generally lower than other in situ technologies. SVE costs are more moderate, because capital and O&M costs of treatment.
Chemical Oxidation	Oxidants are applied to groundwater through wells and/or temporary direct push points. Oxidants include peroxide, permanganate, ozone, and Fenton's reagent. Oxidants increase the contaminant's oxidation state, which may promote sorption or lower toxicity end-products.	Generally implemented as a source area treatment. Groundwater UIC permit required to inject oxidant through wells and temporary direct push points. Hazardous conditions could be created when high oxidant concentrations are applied to explosive vapors.	Chemical oxidation can be effective for treating halogenated and non-halogenated VOCs and SVOCs, PCBs, pesticides, cyanide, and metals. Oxidants are also consumed by other reduced species, which may increase oxidant requirements. Oxidants should be well mixed with contaminants to be effective, which may be feasible in homogeneous aquifer. There may be limited residual treatment capacity. In heterogeneous aquifers, untreated contaminants may leach into groundwater and require additional treatment.	Chemical oxidation costs are moderate. Capital costs vary because of number of wells, radius of influence, and required oxidant. Maintenance costs are limited to monitoring and possible supplemental treatment.
Chemical Reduction	A chemical reductant, e.g., ferrous iron or dithionite, is added to extracted water and injected into the aquifer. Oxidized contaminants such as TCE and Cr(VI) are reduced to less toxic end-products.	May be applied for source area treatment or to create residual treatment capacity downgradient of plume. Class IV groundwater UIC permit required to re-inject hazardous groundwater. Residual dithionite breakdown products may require extraction.	This is an innovative technology that has been applied for TCE and Cr(VI). Treatment capacity is generally resilient and degrades due to reduction of influent oxygen, nitrate, and oxidized contaminants and leaching of ferrous iron. Although effective for oxidized contaminants, may result in increased iron leaching to surface waters.	Chemical reduction costs are moderate. Capital costs vary because of number of wells, radius of influence, and required reductant. Maintenance costs are limited to monitoring and possible supplemental treatment.
Electrokinetic Remediation	A low-intensity electrical current is applied across electrode pairs that have been implanted in the ground across a contaminated source zone. Contaminants are electro-kinetically transported by electrophoresis, electro osmosis, and electro-migration.	Because of the presence of buried metallic conductors, electrokinetic remediation may not be implementable at OU 2.	Electrokinetic remediation has been successful for the remediation of heavy metals in their elemental form. Potential problems affecting this remedy such as salinity and buried metallic objects make this technology inappropriate for OU 2.	Electrokinetic remediation costs depend on specific chemical and hydraulic properties at the site. Energy consumption is directly proportional to contaminant migration rates.

Table 5-2
Groundwater Technology Screening for Operable Unit 2

Technology	Objectives	Implementability	Effectiveness	Cost
Permeable Reactive Barrier (PRB)	PRBs are typically constructed in trenches downgradient of the source zone. The reactive media is typically designed to reduce contaminants to less-toxic end-products and/or promote their sorption. The reactive media may include zero-valent iron (ZVI), chelators, or biostimulated media. PRBs may be combined with subsurface barriers to funnel groundwater through the PRB.	Because the top of the underlying clay layer exists at 40 to 65 ft at OU 2, the PRB would likely be constructed as a hanging wall. PRBs should have a higher permeability than the surrounding formation to not inhibit flow. This may be problematic given the high permeability of the formation.	PRBs are primarily designed to treat halogenated VOCs and SVOCs and inorganic compounds. The long-term effectiveness is a function of the life span of the reactive media. ZVI may be depleted by groundwater oxidants and chelators by sorption capacity, and they may require periodic replacement. Biostimulated media must be maintained to remain effective.	PRBs have relatively high capital costs associated with barrier installation and testing. ZVI and chelator PRBs have very low O&M costs, but may require periodic replacement. Biostimulated media have higher O&M costs, but do not require replacement.
Containment				
Groundwater Pumping	Groundwater is extracted from recovery wells, French drains, and/or interceptor trenches to hydraulically contain contaminated groundwater.	Although groundwater pumping is implementable at OU 2, the Navy has a preference to not install new pump-and-treat systems.	Groundwater pumping is a proven, effective means of containing groundwater contamination, when the system is reliably operated. When plumes are not reduced below CTLs, groundwater pumping turns into a long-term remedy.	Groundwater pumping is both capital and O&M intensive. Groundwater pumping must be coupled with ex situ treatment. Total remediation costs are moderate.
Subsurface Barriers	Subsurface barriers are constructed as a slurry wall, grout curtain, or sheet piling to inhibit horizontal groundwater flow. Subsurface barriers can be applied to complement a PRB or groundwater pumping or to encapsulate contaminated groundwater under an impervious cover.	Subsurface barriers would need to be constructed to an underlying clay layer to prevent seepage below the structure in the high permeability aquifer at OU 2. The top of the underlying clay layer exists at 40 to 65 ft, which is at the limits of conventional slurry wall construction depths. Due to flowing sands, deep soil augering may be most effective means of constructing barrier.	Subsurface barriers are essentially a complementary technology. They probably could not be used in conjunction with PRBs because the reactive media probably could not be constructed with a high enough permeability to convey and treat the larger groundwater volume. Subsurface barriers may be used to complement groundwater pumping when specific receptors are threatened.	Subsurface barriers are capital cost intensive, but have a moderate overall cost.

Table 5-2
Groundwater Technology Screening for Operable Unit 2

Technology	Objectives	Implementability	Effectiveness	Cost
Ex situ Biological Treatment (Assuming Pumping)				
Bioreactors	Extracted groundwater is treated with attached or suspended biological systems. In suspended growth systems such as activated sludge, contaminated groundwater circulates in an aeration basin, where a microbial population aerobically degrades organic matter. In attached growth systems such as trickling filters, microorganisms are established on an inert support matrix to aerobically degrade groundwater contaminants.	Bioreactors are typically applied to treat municipal wastewater. Implementation at OU 2 is not appropriate because of the low concentrations of contaminants in groundwater may inhibit microbial growth. Equipment and materials are readily available.	Biological reactors can destroy organic contaminants that are prone to aerobic biodegradation. However, biochemical oxygen demand loading must be high enough to support the growth of the microbes. The low level of organic contaminants present in OU 2 groundwater would not be sufficient to support the growth of microbes. Other treatment options are more effective.	Ex situ bioremediation is cost effective for large capacity systems, but impracticable for smaller systems.
Ex situ Physical/Chemical Treatment (Assuming Pumping)				
Air Stripping	Extracted groundwater is aerated to remove VOCs from the water. Aeration methods include packed towers, diffused aeration, tray aeration, and spray aeration.	Air stripping is implementable at OU 2. The vapor discharge would require permitting and sampling. Air stripping units are prone to scaling problems and need to periodically be acid-washed. Inorganics are usually sequestered to minimize scaling.	Although air stripping is effective for VOCs, it has limited effectiveness for SVOCs, pesticides/PCBs, and metals.	Air stripping is moderately expensive. Costs significantly increase when vapor treatment is required. Scaling problems may increase O&M costs.
Granular Activated Carbon (GAC) Adsorption	Extracted groundwater is pumped through GAC canisters and contaminants are removed by sorption to the GAC.	GAC is implementable at OU 2. GAC is typically applied as either the sole treatment process or as a secondary treatment process. GAC requires replacement when the head loss increases or when contaminant breakthrough is observed. GAC canisters are usually applied in series with intermittent sampling.	GAC is a relatively nonspecific adsorbent and is effective for the removal of many organic and some inorganic contaminants. Primary treatment is often required to minimize the replacement frequency of the GAC. GAC is typically applied as a secondary treatment for high concentration organics.	GAC has moderate capital and O&M costs. When applied as secondary treatment, capital and O&M costs are marginal.

Table 5-2
Groundwater Technology Screening for Operable Unit 2

Technology	Objectives	Implementability	Effectiveness	Cost
Ion Exchange	Extracted groundwater is pumped through an ion exchange resin. Contamination is removed when ions replace less selective ions from the ion exchange resin.	Ion exchange is implementable at OU 2. Ion exchange is typically applied as a secondary treatment to remove inorganics from the waste stream.	Ion exchange is effective for inorganics, but less effective for organics. Ion exchange resins are replaced and regenerated when the resin becomes depleted. When natural inorganics, e.g., sulfate, are highly concentrated, the resin replacement frequency increases and may make the technology infeasible.	Ion exchange has moderate capital and O&M costs. When applied as secondary treatment, capital costs are marginal. O&M costs are a function of resin replacement frequency.
Coagulation/ precipitation and solids separation	Coagulants are added to extracted groundwater to form insoluble, agglomerated solids, with separation by settling or mechanical filtration.	Coagulation/precipitation is typically applied to as a primary treatment for drinking water and as a secondary treatment for municipal wastewater. Coagulation/flocculation would generate sludge which may require disposal as hazardous waste. Coagulation/flocculation may be implementable, but inappropriate for OU 2.	Coagulation/precipitation is effective at removing solids and inorganics from water. Organics may be incidentally removed by solids separation, but the effectiveness is limited.	Coagulation/precipitation is cost effective for large capacity systems, but impracticable for smaller systems.
Membrane Filtration	Extracted groundwater is pumped through membrane filters to remove dissolved solids. Polyelectrolyte-enhanced ultra-filtration can be used to remove anionic species, e.g., Cr(VI) by chelation and ultrafiltration.	Membrane filtration is implementable at OU 2. Membrane filtration is typically applied as a secondary treatment to remove dissolved solids.	Membrane filtration is typically applied to remove dissolved solids after primary filtration of the groundwater. In some cases, chelating agents may be used to bind some contaminants to facilitate their removal. High head losses may be associated with membrane filtration, which necessitate frequent membrane replacement.	Membrane filtration has moderate capital and O&M costs. As a secondary treatment, capital costs are marginal. O&M costs are functions of the required quantity of chelating agent and of the membrane replacement frequency.

Table 5-2
Groundwater Technology Screening for Operable Unit 2

Technology	Objectives	Implementability	Effectiveness	Cost
Disposal	Groundwater is extracted and discharged to the FOTW where it is treated along with the sanitary sewage.	Depending of the extraction rate, the FOTW can treat the groundwater generated at OU 2. Groundwater must meet pretreatment standards prior to disposal. High salinity groundwater may interfere with bioreactor treatment processes, however, prohibiting its acceptance.	The FOTW should be able to achieve remedial goals for groundwater.	Capital and O&M costs are marginal, but would increase if pretreatment is required.

Notes:

Cr(VI) = hexavalent chromium
CTL = cleanup target level
FOTW = federally owned treatment works
O&M = operation and maintenance
PCB = polychlorinated biphenyl
RG = remedial goal
SVE = soil vapor extraction
SVOC = semivolatile organic compound
TCE = trichloroethene, trichloroethylene
UIC = underground injection control
VOC = volatile organic compound
ZVI = zero-valent iron

5.2 Technology Screening

This section summarizes the rationale for eliminating or retaining each of the identified technologies for OU 2 soil and groundwater.

5.2.1 Eliminated Technologies

The following technologies were screened from further consideration:

In situ Soil Technologies

Bioventing was eliminated from further consideration because it has limited effectiveness for SVOCs and no effectiveness for inorganics. The high water table, permeable soil, and impervious cover in many areas of OU 2 also preclude its use.

Solidification/stabilization was eliminated from consideration because it has limited effectiveness for SVOCs and VOCs, it does not decrease contamination below the direct exposure CTLs, debris in the Site 11 landfill may inhibit construction, a large percentage of binding agents would be required for the sandy soil, and the presumed 15% bulking of the soil might inhibit further use of the property.

Ex situ Soil Technologies

The ex situ soil treatment technologies are only used when the soil will be reused onsite or when the soil exceeds land disposal restrictions (LDRs). If excavated soil contaminant concentrations exceed 10 x UTS (universal treatment standards) as defined in 40 CFR §268.48, the soil must be treated regardless of the disposal option. If the excavated soil is to be used onsite, it must be treated to C/I direct exposure and groundwater leachate CTLs. Alternately, excavated soil could be capped onsite in a disposal corrective action management unit (CAMU). Because of spatially limitations, however, disposal CAMUs were not evaluated as a disposal option.

To assess whether ex situ soil technologies are necessary, all of the soil samples collected for the OU 2 RI and RI addendum that exceeded the C/I direct exposure or groundwater-based leachability CTLs were screened against the 10 x UTS LDR criteria. Only one organic analyte exceeded the 10 x UTS LDR criterion. In sample 025S001600, the detected concentration of endrin aldehyde was

1.7 milligrams per kilogram (mg/kg). This concentration exceeded the 1 mg/kg leachability criterion for endrin in 62-777, FAC, Table II, and 10 times the 0.13 mg/kg UTS in 40 CFR §268.48. Given the marginal exceedance, the concentration of endrin aldehyde would be expected to be incidentally reduced to below the 10 x UTS LDR criterion by attenuation processes, either before or after excavation.

Although no metals exceeded the UTS, which are expressed in TCLP leachate concentrations, the soil samples were not comprehensively analyzed for TCLP metals. In the 10 soil samples collected from Site 25 and the 36 samples collected from Site 27 that were analyzed for TCLP metals, no metals were detected in the leachate. When the soil concentration of metals (in mg/kg) is divided by 20 (which yields milligrams per liter [mg/L] when all metal is assumed to leach), there were 48 metal analyte exceedances. The possibility of these 48 samples exceeding the 10 x UTS LDR criteria was evaluated by multiplying the soil concentrations (in mg/kg) by the ratio of the leachate detection limits (in mg/L) to the corresponding soil concentrations (in mg/kg) for the 46 TCLP analyte analyses performed at Sites 25 and 27. Because leachate detection limits are used as opposed to actual leachate concentrations, this calculation does not indicate an exceedance of the 10 x UTS LDR criteria. Rather, this calculation indicates that these locations may need to be re-evaluated to determine whether metals treatment may be necessary prior to land disposal. The samples identified for further TCLP evaluation are shown in Table 5-3.

Table 5-3
Soil Samples that Need Further Evaluation
to Determine Whether Land Disposal Restrictions are Pertinent for Excavated Soils

Sample	Potential Analyte Exceedances	Sample	Potential Analyte Exceedances
011SLF0303	Cadmium, Lead	012S001001	Cadmium
011SLF0405	Cadmium, Lead	012S001005	Cadmium
011SLF1006	Cadmium	012S001610	Cadmium
011SLF1305	Lead	025S001500	Lead
011SRA0501	Chromium	027S005300	Cadmium, Lead, Mercury
		027S005301	Mercury

Solid phase bioremediation was eliminated from consideration because excavated soils are not anticipated to exceed LDRs for organic constituents and bioremediation is ineffective for metals treatment.

Slurry phase bioremediation was eliminated from consideration because excavated soils are not anticipated to exceed LDRs for organic constituents and bioremediation is ineffective for metals treatment.

Chemical/physical oxidation was eliminated from consideration because excavated soils are not anticipated to exceed LDRs for organic constituents and probably do not exceed LDRs for metal constituents. Although chemical/physical oxidation may effective for treating hexavalent chromium, the oxidation state of chromium is unknown, and reduction processes may be counterproductive to other metal removal processes.

Soil washing is suitable for metals treatment using an acid extraction process. Soil washing is eliminated from further consideration, however, because the necessity of metals pretreatment is speculative. The pretreatment necessity may be assessed by resampling the locations cited in Table 5-3 and analyzing the samples for TCLP metals. Although organics are not anticipated to exceed LDRs, a separate solvent extraction process would be applicable for organics.

Solidification/stabilization is suitable technology for binding metals in the soil matrix. There is no evidence, however, to suggest that metals leach from the soil under TCLP. Solidification/stabilization is eliminated from further consideration because the necessity of metals pretreatment is speculative. The pretreatment necessity may be assessed by resampling the locations cited in Table 5-3 and analyzing the samples for TCLP metals.

Incineration/pyrolysis was eliminated from consideration because excavated soils are not anticipated to exceed LDRs for organic constituents and incineration/pyrolysis is ineffective for metals treatment.

Thermal desorption was eliminated from consideration because excavated soils are not anticipated to exceed LDRs for organic constituents and thermal desorption is ineffective for metals treatment.

In situ Groundwater Technologies

Enhanced bioremediation was eliminated from further consideration because it is generally ineffective for metals contamination. The high hydraulic conductivity also limits the effectiveness of enhanced bioremediation. As reported in the RI, the geometric mean of the hydraulic conductivity in the shallow wells at OU 2 was 167.7 feet per day (ft/day). The high hydraulic conductivity limits the duration of organic groundwater contaminants in the enhanced groundwater area, which limits the bioremediation effectiveness.

Monitored natural attenuation was eliminated from further consideration because several metal, VOC, and SVOC surface water CTL exceedances were observed in monitoring wells adjacent to Wetlands 5A, 6, and 7. The high permeability aquifer and the proximity of the surface water receptors also preclude the application of MNA.

Air sparging/soil vapor extraction was eliminated from further consideration because a significant mass of VOCs is not present and is ineffective for SVOC and metals. The high water table and impervious cover would also limit its effectiveness.

Chemical oxidation was eliminated from further consideration because it is ineffective for metals remediation. Because it is generally applied as a source zone technology, it was eliminated from further consideration for SVOCs and VOCs.

Chemical reduction was eliminated from further consideration because it is generally only effective for chlorinated ethenes and hexavalent chromium. Furthermore, the high water table and low soil iron content limit its effectiveness. Iron leaching to the adjacent wetlands would also be undesirable.

Electrokinetic remediaton was eliminated from further consideration because the presence of buried metallic debris in the Site 11 landfill and the presence of utilities near the buildings. In addition, the high salinity makes implementation difficult.

Ex situ Groundwater Technologies

Bioreactors were eliminated from further consideration because these systems are generally applicable to larger scale systems and the limited organic concentration in the extracted groundwater may inhibit the system. Bioreactors also have limited effectiveness for chlorinated ethenes and metals.

Ion exchange was eliminated from further consideration because ion exchange is typically applied as a secondary treatment for metals after the primary filtration of groundwater. Metal contamination has limited severity and would be adequately treated by alternative treatment methods.

Coagulation/precipitation and solids separation was eliminated from further consideration because this process is generally applicable to larger scale water and wastewater treatment systems. Although this technology is effective for metal contamination, large quantities of sludge would be generated, which may be classified as hazardous waste. Organics would only be treated when sorbed to solids and precipitated.

Membrane filtration was eliminated from consideration because it is typically applied as secondary treatment to remove dissolved contaminants after the primary filtration of groundwater. High head losses are also associated with membrane filtration, making this treatment technology impractical for groundwater treatment at OU 2, which must be pumped at a high rate because of the high hydraulic conductivity.

5.2.2 Retained Technologies

Soil technologies retained for further consideration:

- surface capping

- phytoremediation
- excavation and offsite disposal

Groundwater technologies retained for further consideration:

- phytoremediation
- permeable reactive barrier
- groundwater pumping and discharge to FOTW
- groundwater pumping, treatment, and discharge to the wetlands, with air stripping used as primary treatment and granular activated carbon used as secondary treatment

6.0 ASSEMBLY OF ALTERNATIVES

RAAs are assembled from the retained technologies for OU 2 soil and groundwater. Media-specific RAAs can be developed when media interactions are insignificant. Although source areas were not explicitly identified at OU 2, soil CTL exceedances were predominantly related to the leachate based on groundwater criteria. Although soil leachate pathway is a concern, groundwater currently provides no beneficial use. Groundwater contamination was observed to exceed surface water CTLs in monitoring wells adjacent to Wetlands 5A, 6, and 7. Thus, the protection of surface water receptors is a principal concern. Although a significant interaction may exist between soil and groundwater contamination, media-specific RAAs are developed because these RAAs may principally address different receptors.

The media-specific RAAs are developed on a site-wide basis for OU 2. Site-wide RAAs are developed because remedial actions would presumably be performed concurrently for Sites 11, 12, 25, 26, 27, and 30 and contamination is similar. The assembled alternatives can contain multiple treatment technologies. As stated in OSWER Directive 9355.3-01, the assembled alternatives should preferably include a no-action alternative, one or more containment alternatives, one or more treatment alternatives, and a removal alternative.

6.1 Remedial Action Alternatives for Soil Contamination

The RAAs for soil contamination include the no-action alternative, institutional controls as a limited action alternative, soil and asphalt capping as a control alternative, phytoremediation covers and selected asphalt capping as a treatment alternative, and excavation and offsite disposal as a removal alternative.

6.1.1 Alternative 1: No Action

The NCP requires that a no-action alternative be considered as a "baseline" for the evaluation of other alternatives. Under this alternative, no changes would be made to existing site operations. While the current and projected land use for this site is expected to remain industrial, no institutional controls would be added to guarantee the exposure pathway would remain industrial.

Without institutional controls, the site would be managed under Risk Management Option Level I, pursuant to 62-780.680(1), FAC, and residential direct exposure CTLs would govern.

Implementability

The NCP requires any alternative that contamination onsite be reevaluated every 5 years to ensure its adequacy. Therefore, the Navy would be required to perform a 5-year review to assess the adequacy of the no-action alternative.

Effectiveness

The no-action alternative is not effectively protecting human health, as contaminants above residential and C/I soil CTLs are left onsite. As shown in Figures 4-4, 4-10, and 4-13, there would be numerous metal, pesticide, and SVOC exceedances of the residential direct exposure CTL for potential future site residents. Residential development in some areas is unlikely, however. The Site 11 landfill and the land adjacent to Wetlands 7 and 64 would be undesirable for future residential development. As shown in Figures 4-6, 4-7, 4-12, 4-15, 4-17, and 4-18, the soil leachate CTLs would be exceeded in several locations. Thus, soil contamination would likely continue to leach to groundwater in OU 2.

Cost

The no-action alternative includes conducting six 5-year reviews. The default parameters in RACER are based on the *Comprehensive Five-Year Review Guidance* (USEPA, June 2001). The RACER cost summary reports for the no-action alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value and 2) the phase technology cost detail for 5-year reviews. The 5-year review tasks include the document review of the 5-year review checklist and previous 5-year review reports; interviews with current and previous staff management, state and local government contacts; general site inspection and documentation; regulatory compliance inspection; report generation; and 2 days of travel. The estimated cost of the 5-year reviews is $16,600 multiplied by the escalation factor. The present value cost is calculated by discounting the site costs over time at a 6% discount rate. The present value cost of the no-action alternative is $53,200.

The no-action alternative cost was developed as a basis for comparison with other media-specific RAAs. Because media-specific RAAs for soil and groundwater would likely be performed concurrently, tasks such as the 5-year reviews may be redundant. To avoid redundancy, the 5-year review costs are not estimated in the groundwater RAAs, which are given in Section 6.2.

6.1.2 Alternative 2: Institutional Controls

This alternative would be limited to institutional controls, which would permit OU 2 to be managed using Risk Management Option Level II, pursuant to proposed 62-780.680(2), FAC. This option permits soil to be evaluated using C/I direct exposure CTLs. Although not included in this alternative, this option also permits the use of engineering controls for the management of onsite contamination.

Implementability

NAS Pensacola currently operates as a C/I facility, and the base is not proposed for realignment and closure. Thus, C/I status can be achieved through the implementation of land-use control agreements to limit site access and property use. Annual compliance with the land-use control agreements may be necessary. If the property was transferred and onsite contamination remains above applicable requirements, the Navy would be required to deed restrict OU 2 as C/I property. The Navy has qualified planners and attorneys, who can develop and implement proper institutional controls for OU 2.

C/I direct exposure criteria are based on the intermittent exposure of adults and are only appropriate when engineering or institutional controls proposed for the site would reliably restrict the exposure frequency and duration. Although construction workers do not fit the assumptions for residential exposure, FDEP requires that an institutional control specify that construction workers be notified of potential contamination, using residential direct exposure criteria, and that proper protective equipment be used based on requirements from the Occupational Safety and Health Administration (OSHA) (FDEP, 1999). Therefore, before invasive activities begin, it would be required that the Base Environmental Office be notified to ensure proper worker protection.

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. Therefore, the Navy would be required to perform a 5-year review to assess the adequacy of the institutional controls alternative.

Effectiveness

The institutional controls alternative would not provide any additional effectiveness for the current use scenario but would provide long-term effectiveness by restricting future use and access. Figures 4-5, 4-11, and 4-14 show that there would be numerous metal, pesticide, and SVOC exceedances of the C/I direct exposure CTL. Exposure to site workers would be minimized by proper notification and OSHA compliance. As shown in Figures 4-6, 4-7, 4-12, 4-15, 4-17, and 4-18, the soil leachate CTLs would be exceeded in several locations. Thus, soil contamination would likely continue to leach to groundwater in OU 2.

Cost

The institutional controls alternative includes the planning and implementation of institutional controls and conducting six 5-year reviews. The default parameters in RACER are based on the *Comprehensive Five-Year Review Guidance* (USEPA, June 2001). The RACER cost summary reports for the institutional controls alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for institutional controls, and 3) the phase technology cost detail for 5-year reviews. The institutional controls tasks include institutional analysis, plan development, processing agreement, plan execution, and deed notice. The 5-year review tasks include the document review of the 5-year review checklist and previous 5-year review reports; interviews with current and previous staff management, state and local government contacts; general site inspection and documentation; regulatory compliance inspection; report generation; and 2 days of travel. The estimated cost of institutional controls is $21,900. The estimated cost of the 5-year reviews is $16,600 multiplied by the escalation factor. The present value cost is calculated by discounting the site costs over time at a 6% discount rate. The present value cost of the no-action alternative is $75,100.

6.1.3 Alternative 3: Soil and Asphalt Capping

Surface capping reduces the risk of exposure to contaminated soil, thus eliminating the direct exposure pathway. When constructed as low permeability covers, surface capping also reduces infiltration, which permits higher CTLs to be calculated based on leachability criteria. The proposed surface capping areas are shown in Figure 6-1. Asphalt covers would be constructed in four distinct areas, and soil covers would be constructed in four distinct areas. The capping locations are selected based on SCTL exceedances shown in Figures 4-5 to 4-7, 4-11, 4-12, 4-14, 4-15, 4-17, and 4-18. Table 6-1 describes the locations and dimensions of the proposed capping areas.

Table 6-1
Description of Proposed Capping Areas (Shown in Figure 6-1)

Description	Location	Dimensions
Asphalt Cap 1	Site 12, east of Building 781, south of Building 740, north of Building 455	280-ft x 600-ft rectangular cap
Asphalt Cap 2	Site 12, east of Building 3821	80-ft x 160-ft rectangular cap
Asphalt Cap 3	Site 25, east of Building 780	160-ft x 240-ft rectangular cap
Asphalt Cap 4	Site 27	360-ft x 440-ft rectangular cap
Soil Cap 1	Site 11, east of Pat Bellinger Road	50-ft x 300-ft rectangular cap
Soil Cap 2	Site 11, east of Yacht Basin, west of Clay Road	240-ft x 240-ft right-triangular cap
Soil Cap 3	Site 30, along Wetland 5B	100-ft x 970-ft rectangular cap
Soil Cap 4	Site 30, south of Building 649	100-ft x 400-ft rectangular cap

Although the proposed asphalt and soil caps are protective of most of the C/I direct exposure and leachability SCTL exceedances, several isolated exceedances occur near Sites 27 and 30. The isolated exceedances include sample locations 27GS06, 27GS10, 27S09, 30GS154, 30S138, 30S148, 30S150, and 30S151. These exceedances would be addressed by excavating the top 2 feet of soil from these locations and consolidating it under the Site 27 asphalt cap. The total estimated excavation volume is 950 CYs. Excavated soil would remain in the same area and, though not contiguous, may be managed as a single area of contamination. Otherwise, the Site 27 asphalt cap would need to be constructed pursuant to the disposal CAMU regulations (40 CFR §264.552). Excavated areas would be recovered with clean fill. The proposed excavation areas are shown in Figure 6-1.

Implementability

The construction of soil and asphalt covers is technically feasible at OU 2, and the designated areas are amenable to the specified capping materials. Prior to the full-scale design and concurrent with construction activities, confirmation samples would need to be collected to verify that the contaminated soils are properly addressed by this remedy. The soil covers would require regular maintenance to minimize the erosion of the cap, and additional construction may be necessary if significant erosion of the cap is observed.

Because contamination would be left onsite, the soil and asphalt capping alternative includes the implementation of institutional controls. This permits OU 2 to be managed using Risk Management Option Level II, pursuant to proposed 62-780.680(2), FAC. This option permits soil to be evaluated using C/I direct exposure CTLs and for surface capping to be used as an engineering control.

As stated in OSWER No. 9355.7-03B-P, 5-year reviews may no longer be needed when no hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure. Because surface capping does not meet this criterion, 5-year reviews are included as a component of this alternative.

Effectiveness

Surface capping, a control technology that does not reduce the volume or toxicity of waste, provides reliable protection against the direct exposure to contaminated soils. When constructed as low permeability covers, surface capping also reduces infiltration, which permits higher CTLs to be calculated based on leachability criteria, pursuant to 62-777, FAC, Figure 8. In this equation, the dilution factor can be increased based on the decreased infiltration rate using equations presented in the USEPA's *Soil Screening Guidance: Technical Background Document* (USEPA, 1996). Soil covers require regular maintenance to ensure their reliability, and soil and asphalt covers require periodic inspection.

The construction of the asphalt caps also benefits the industrial usage of the site. The area of the proposed Site 25 asphalt cap is currently covered with interlocking, perforated metal sheets and is used for heavy vehicle parking. The area of the proposed Site 27 asphalt cap is currently used as a parking lot for light vehicles.

Cost

The asphalt caps would be constructed of hydraulic asphalt concrete, which is used as a hydraulic barrier. The asphalt is 4 inches thick, which will be suitable for light vehicle traffic. The asphalt is underlain by 12 inches of base rock, a geotextile drainage fabric, and 6 inches of leveling fill. The soil covers would be constructed of 6 inches of topsoil, 12 inches of soil cover, 12 inches of compacted clay, and 6 inches of leveling fill. The asphalt and soil caps would be contoured to prevent the run-on of surface water and to direct the runoff into the storm sewer or onto adjacent grassy areas, as appropriate. The proposed locations would be cleared and grubbed, and the debris would be disposed offsite.

The RACER cost summary reports for the soil and asphalt capping alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for asphalt caps, 3) the phase technology cost detail for soil caps, 4) the phase technology cost detail for excavation, 5) the phase technology cost detail for institutional controls, 6) the phase technology cost detail for 5-year reviews, and 7) the phase cost summary for design. The first-year cost of the soil and asphalt capping alternative is $2,654,000. Long-term costs include cap maintenance and conducting 5-year reviews, which are required when contamination is left onsite. The annual maintenance cost of the soil caps is $15,500, multiplied by the escalation factor. When discounted at 6%, the total present value of the soil and asphalt capping alternative is $3,412,500.

6.1.4 Alternative 4: Phytoremediation Covers and Asphalt Capping

Phytoremediation is a process that uses plants to remove, transfer, stabilize, and degrade contaminants in soil and groundwater. Phytoremediation processes are distinguished according to EPA/600/R-99/107 (USEPA, February 2000) as follows:

- *Phytoextraction* is the uptake of contaminants by plant roots and translocation within the plants.

- *Rhizofiltration* is the adsorption or precipitation onto plant roots, or absorption into the roots of contaminants that are in solution surrounding the root zone, due to biotic or abiotic processes.

- *Phytostabilization* is defined as (1) immobilization of a contaminant in soil through absorption and accumulation by roots, adsorption onto roots, or precipitation within the root zone of plants and (2) the use of plants and plant roots to prevent contaminant migration via wind and water erosion, leaching, and soil dispersion.

- *Rhizodegradation* (also known as *rhizosphere bioremediation*) is the breakdown of an organic contaminant in soil through microbial activity enhanced by the presence of the root zone.

- *Phytodegradation* (also known as *phytotransformation*) is the breakdown of contaminants taken up by plants through metabolic process within the plant or breakdown of contaminants external to the plant through the effect of enzymes produced by the plant.

- *Phytovolatization* (also known as *phytotransformation*) is the uptake and transpiration of a contaminant by the plant, with release of the contaminant or a modified form of the contaminant to the atmosphere from the plant through contaminant uptake, plant metabolism, and plant transpiration.

In a soil remedy, phytoremediation is typically applied as a vegetative cover system. Vegetative covers are designed as long-term, self-sustaining systems of plants growing in and/or over materials that pose environmental risk. A vegetative cover may reduce the risk to an acceptable level and generally requires minimal maintenance. Vegetative covers are distinguished as follows:

- *Evapotranspiration covers* are composed of soil and plants engineered to maximize the available storage capacity of soil, evaporation rates, and transpiration processes of plants to minimize water infiltration. The evapotranspiration cap is a form of hydraulic control by plants. Risk reduction relies on the isolation of contaminants to prevent human or wildlife exposure and the reduction of leachate formation and movement. Caps are designed with sufficient thickness and permeability to hold moisture such that infiltration is minimized by evapotranspiration processes.

- *Phytoremediation covers* consist of soil and plants to minimize infiltration of water and to aid in the degradation of underlying waste. Risk reduction relies on the degradation of contaminants, the isolation of contaminants to prevent human or wildlife exposure, and the reduction of leachate formation and movement. Phytoremediation covers incorporate certain aspects of hydraulic control, phytodegradation, rhizodegradation, phytovolatilization, and perhaps phytoextraction.

The phytoremediation covers and asphalt capping alternative is identical to the soil and asphaltcapping alternative, except that phytoremediation covers are used instead of soil covers. Phytoremediation covers may be especially applicable near the adjacent wetlands where surface capping is invasive and where site use is limited. Phytoremediation covers may also be more compatible with the selected groundwater RAA. Although phytoremediation covers may impede stormwater more than a soil cover, phytoremediation covers would be more resilient. The locations of the proposed asphalt caps, phytoremediation covers, and areas to be excavated are shown in Figure 6-2.

Implementability

The construction of phytoremediation covers is technically feasible at OU 2. The designated areas adjacent to Wetlands 5A and 5B and the Yacht Basin are in undeveloped areas and are amenable to phytoremediation covers. This alternative would continue to include asphalt capping in areas designated in Figure 6-2. Prior to the full-scale design and concurrent with construction activities, confirmation samples would need to be collected to verify that the contaminated soils are properly addressed by this remedy. The phytoremediaton covers would require regular maintenance to maintain a vegetative presence and possibly to harvest plants designed for phytoextraction.

Pilot testing is needed to facilitate the final design of the phytoremediaton cover. The purpose of the pilot test would be to identify and verify that appropriate plants can be grown in the site soils. These studies are typically performed using samples of site soil in which the prospective vegetation is grown in an offsite greenhouse. Pilot studies are also used to determine the nutrient amendments needed for successful application.

Because contamination would be left onsite, the phytoremediation covers alternative includes the implementation of institutional controls. This permits OU 2 to be managed using Risk Management Option Level II, pursuant to 62-780.680(2), FAC. This option also permits soil to be evaluated using C/I direct exposure CTLs and for phytoremediation covers to be used as engineering controls.

As stated in OSWER No. 9355.7-03B-P (USEPA, June 2001), 5-year reviews may no longer be needed when no hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure. Asphalt capping does not meet this criterion. Although phytoremediaton covers provide stimulated treatment and hydraulic control, contamination would likely remain onsite. Thus, 5-year reviews are included as a component of this alternative.

Effectiveness

Phytoremediation covers are designed for several purposes. Contaminants may be treated by rhizodegradation and phytotransformation processes, removed by phytoextraction, or controlled by phytostabilization and hydraulic control. As discussed in *Introduction to Phytoremediation* (USEPA, February 2000), several of the phytoremediation treatment processes are applicable to the organic and metal COPCs found in OU 2. The treatment and removal mechanisms may sufficiently reduce contamination to below C/I direct exposure and leachability-based SCTLs. Hydraulic control holds the moisture in place so that evapotranspiration processes limit the infiltration. When reduced infiltration rates are verified, it may be appropriate to calculate higher, remedy-specific leachability-based SCTLs, pursuant to 62-777, FAC, Figure 8.

Asphalt capping, a control technology that does not reduce the volume or toxicity of waste, provides reliable protection against the direct exposure to contaminated soils. When constructed as low permeability covers, asphalt capping also reduces infiltration, which permits higher CTLs to be calculated based on leachability criteria.

The construction of the asphalt caps also benefits the industrial usage of the site. The area of the proposed Site 25 asphalt cap is currently covered with interlocking, perforated metal sheets and is used for heavy vehicle parking. The area of the proposed Site 27 asphalt cap is currently used as a parking lot for light vehicles.

Cost

The asphalt caps would be constructed of hydraulic asphalt concrete, which is used as a hydraulic barrier. The asphalt is 4 inches thick, which will be suitable for light vehicle traffic. The asphalt is underlain by 12 inches of base rock, a geotextile drainage fabric, and 6 inches of leveling fill. The asphalt caps would be contoured to prevent the run-on of surface water and to direct the runoff into the storm sewer or onto adjacent grassy areas, as appropriate. The proposed locations would be cleared and grubbed, and the debris would be disposed offsite.

The phytoremediation covers would consist of the selected phytoremediation vegetation and would include the construction of an irrigation and nutrient amendment system. The proposed locations would be cleared and grubbed, and the debris would be disposed offsite. The phytoremediation covers would be actively managed for 10 years. Active management includes irrigation and nutrient amendment, replanting, inspection, mowing/maintenance, and natural attenuation monitoring.

The RACER cost summary reports for the phytoremediation cover and asphalt capping alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for asphalt caps, 3) the phase technology cost detail for phytoremediation covers, 4) the phase technology cost detail for O&M, 5) the phase technology cost detail for excavation, 6) the phase technology cost detail for institutional controls, 7) the phase technology cost detail for 5-year reviews, and 8) the phase cost summary for design. The first-year cost of the phytoremediation cover and asphalt capping alternative is $2,117,500. Natural attenuation sampling would be conducted for 10 years, with an annual cost of $18,700, multiplied by the escalation factor. Phytoremediation O&M would be conducted for 30 years, with an annual cost of $31,400, multiplied by the escalation factor. Long-term costs also include conducting 5-year reviews, which are required when contamination is left onsite. When discounted at 6%, the total present value of the phytoremediation cover and asphalt capping alternative is $2,847,700.

6.1.5 Alternative 5: Excavation and Offsite Disposal

This alternative involves excavating surface soil that exceeds C/I direct exposure CTLs and vadose zone soil that exceeds leachability CTLs based on groundwater. Figure 6-3 shows the proposed areas for excavation, which are based on CTL exceedances shown in Figures 4-5 to 4-7, 4-11, 4-12, 4-14, 4-15, 4-17, and 4-18. When soil contamination appears contiguous, larger areas of soil would be excavated. In cases were the soil contamination appears isolated, surgical excavation would be performed in 40-foot x 40-foot sections. The proposed areas of excavation would be excavated to 2 feet bgl and subsurface soil contamination is not addressed.

Subsurface CTLs were only exceeded in three locations. In sample 30S013820, the sample depth was 20 feet bgl and presumably below the water table, and thus excluded from consideration. In sample 011S001506, total chromium concentration was 48 µg/kg, which slightly exceeded the hexavalent chromium leachability CTL of 38 µg/kg. Because most of the chromium presumably exists as trivalent chromium, this was excluded from consideration. In sample 011S000606, the concentration of PCE was 30 µg/kg, which was equal to leachability CTL of 30 µg/kg. This sample was also excluded from consideration.

The excavated soils would be disposed offsite. Although the excavated soils would not be characteristic of hazardous waste, they may include listed hazardous waste. If the excavated soils are determined to contain listed hazardous waste above health-based limits, the excavated soils would be hazardous waste because of the contained-in policy. FDEP's August 21, 2002, memorandum on "Management of Contaminated Media Under RCRA" explicitly states that the health-based limits are residential soil CTLs. Because soils would be excavated based on C/I CTLs, it is assumed in this FS that the excavated soils would be hazardous waste. Thus, if the excavated soils are disposed offsite, they must be disposed in a RCRA Subtitle D landfill. Although the excavated soils could also be disposed in an onsite disposal CAMU, this option was not explored in this FS.

Hazardous waste is subject to the LDRs. When soil contamination exceeds 10 x UTS, as defined in 40 CFR §268.48, the soil must be treated prior to land disposal. As discussed in Section 5.2.1, a detection of endrin aldehyde in sample 025S001600 was the only analyte found to exceed both risk and treatment criteria, and its exceedance was marginal. The concentration of endrin aldehyde would be anticipated to incidentally attenuate to below risk and/or treatment criteria, either before or after excavation. Although no metals were identified to exceed the TCLP LDR criteria, sample locations listed in Table 5-3 may need further evaluation to assess the pretreatment necessity.

Implementability

Excavation and offsite disposal is technically and administratively feasible at OU 2. Excavation is performed frequently and is a reliable method to remove contaminated soil within given boundaries. The excavated soil volume is not anticipated to be sufficient to impose landfill capacity limitations.

Because contamination exceeding residential direct exposure CTLs would be left onsite, the excavation and offsite disposal alternative includes the implementation of institutional controls. This permits OU 2 to be managed using Risk Management Option Level II, pursuant to 62-780.680(2), FAC.

As stated in OSWER No. 9355.7-03B-P, 5-year reviews may no longer be needed when no hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure. With the implementation of institutional controls, this criterion is satisfied for soil. Thus, 5-year reviews are not needed as a component of this alternative. Nevertheless, groundwater contamination would be left onsite. In the media-specific RAAs in this FS, 5-year reviews are included for the soil remedies. Thus, 5-year reviews for groundwater contamination are included in the excavation and offsite disposal alternative.

Effectiveness

Excavation and offsite disposal reduces the volume of contamination. Because soil exceeding C/I direct exposure and groundwater-based leachability CTLs would be removed from the site, reductions of toxicity and mobility are not relevant.

Although the short-term inhalation, ingestion, and contact risk to site workers (excavation crew) would increase during excavation, risk would be limited to the remedial action period. Occupational risk would be reduced through proper use of personal protective equipment (PPE) and engineering controls. Because no residential areas are adjacent to OU 2, there are no short-term risks to the surrounding community. No onsite long-term risks are associated with the excavation and offsite disposal alternative because the exposed soil exceeding CTLs would be removed from the site.

Cost

The 246,400 square feet of contaminated surface soil, as identified in Figure 6-3, would be excavated to 2 feet bgl. Because direct exposure criteria are not applicable below 2 feet, base samples would not be collected. In this cost estimate, side-wall samples are also not considered. This cost estimate includes the collection and analysis of 40 samples for waste characterization. The samples would be analyzed for total metals, pesticides/PCBs, SVOCs, VOCs, and TCLP metals, SVOCs, and VOCs. The 18,250 CY of excavated soil would be disposed offsite as hazardous waste. This estimate assumes that the excavated soil would be transported 200 miles to RCRA Subtitle D landfill in Emelle, Alabama. The RACER estimated disposal fee of $185.64/CY is the primary cost-driver for this alternative. Chemical Waste Management was contacted to confirm that this unit rate is appropriate for hazardous waste disposal in Emelle, Alabama.

The RACER cost summary reports for the excavation and offsite disposal alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for excavation, transport, and disposal, 3) the phase technology cost detail for institutional controls, and 4) the phase technology cost detail for 5-year reviews. The first-year cost of the excavation and offsite disposal alternative is $4,996,300. Long-term costs are limited to conducting 5-year reviews, which are required when contamination is left onsite. When discounted at 6%, the total present value of the excavation and offsite disposal alternative is $5,049,500.

6.2 Remedial Action Alternatives for Groundwater Contamination

The RAAs for groundwater contamination include the no-action alternative, riparian corridors and PRBs as treatment alternatives, and groundwater pumping as a removal and control alternative.

Groundwater remedies are inherently long term and contamination is usually left onsite. Thus, 5-year reviews are an appropriate component of all of the groundwater RAAs. Because 5-year reviews are considered in the media-specific RAAs for soil, however, they are not also estimated for the groundwater RAAs. Similarly, the inclusion of institutional controls would be redundant, and they are not included as a component in the groundwater RAAs.

6.2.1 Alternative 1: No Action

The NCP requires that a no-action alternative be considered as a "baseline" for the evaluation of other alternatives. The no-action alternative does not include any remedial action or institutional controls but does include groundwater monitoring. Groundwater monitoring shall be performed pursuant to 62-780.750, FAC, *Post Active Remediation Monitoring*. The sampling requirements include the following:

- At least one well sampled at the downgradient edge of the plume.
- At least one well sampled in the area(s) of highest groundwater contamination.
- Groundwater sampled quarterly or at approved interval.
- Samples analyzed for contaminants present prior to the initiation of active remediation.

Using this standard, six wells are selected as candidates for long-term monitoring. The candidate monitoring wells were selected based on the groundwater CTL exceedances for metals, SVOCs, and VOCs, which are shown in Figures 4-9, 4-16, and 4-19. The candidate monitoring wells and analytical parameters are given in Table 6-2. Long-term monitoring would be conducted for 30 years.

Table 6-2
Candidate Monitoring Wells and Analytical Parameters for Long-Term Monitoring

Monitoring Well	Monitoring Purpose	Analytical Parameters	Monitoring Well	Monitoring Purpose	Analytical Parameters
11GS47	Downgradient Edge of Plume	VOCs, SVOCs, metals	27GS19	Source Area — Highest Concentration	VOCs, SVOCs
11GS52	Downgradient Edge of Plume	VOCs, metals	30GS06	Downgradient Edge of Plume	VOCs, SVOCs, metals
11GI12	Downgradient Edge of Plume	VOCs	30GI170	Downgradient Edge of Plume	VOCs

Implementability

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. This evaluation would include the spatial and temporal analyses of groundwater data to assess whether there are increasing, decreasing, or stationary trends in the concentrations of groundwater contaminants. This evaluation would be used to recommend continuation, increases, or decreases in the number of samples and types of analyses required to reevaluate the no-action alternative in subsequent 5-year reviews. Because 5-year reviews are considered in the media-specific RAAs for soil, they are not also estimated here.

Effectiveness

The no-action alternative does not effectively protect human health. Although the surficial zone of the sand and gravel aquifer currently has no beneficial use, groundwater contamination may continue to exceed ingestion criteria, as shown in Figures 4-9, 4-16, and 4-19. Groundwater may continue to discharge to the adjacent wetlands at concentrations exceeding the Class III surface water standards. Class III surface water criteria are protective of recreational use and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife.

Cost

The groundwater no-action alternative does not include conducting 5-year reviews because it would be redundant with the estimate for the soil no-action alternative shown in Section 6.1.1. The groundwater no-action alternative does include quarterly groundwater sampling of six monitoring wells with quality control samples. These wells are sampled using a low-flow sampling protocol and analyzed for the parameters listed in Table 6-2. The RACER summary costs for the groundwater no-action alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value and 2) the phase technology cost detail for long-term groundwater monitoring. The annual cost of groundwater monitoring is $55,200 multiplied by the escalation factor. The present value cost is calculated by discounting the site costs over time at a 6% discount rate. The present value cost of the groundwater no-action alternative is $983,800.

6.2.2 Alternative 2: Riparian Corridors

Riparian corridors are an application of phytoremediaton. Phytoremediation processes are reviewed in Section 6.1.4. In a groundwater remedy, phytoremediation is typically applied as a riparian corridor and/or used for hydraulic control. These two applications are summarized as follows:

- *Hydraulic control* is the use of plants to remove groundwater through uptake and consumption to contain or control the migration of contaminants.

- *Riparian corridors/buffer strips* are generally applied along streams and river banks to control and remediate surface water runoff and groundwater contamination moving into the river. They may incorporate certain aspects of hydraulic control, phytodegradation, rhizodegradation, phytovolatilization, and perhaps phytoextraction.

Because the rooting depths of most crops are 1 to 4 feet, groundwater remedies predominantly utilize trees, which have been shown capable of remediating groundwater with water table depths of less than 30 feet. Riparian corridors are constructed by planting fast growing phreatophyte trees, including cottonwoods and poplars, in closely spaced, trenched rows. Typically, the riparian corridor consists of a triple row of trees and has a minimum width of 30 feet.

The riparian corridor alternative would not directly address groundwater exceedances in the industrial, developed areas of OU 2. In these areas, groundwater contamination would be permitted to naturally attenuate. Riparian corridors would be planted along the banks of the adjacent wetlands near Sites 11 and 30, as shown in Figure 6-4. The intended purpose of the riparian corridors would be to protect the surface water receptors by 1) treating and removing groundwater contamination and 2) by potentially limiting the infiltration of groundwater into surface water by transpiring the groundwater into the trees.

The riparian corridors alternative includes post-active remediation monitoring, as specified in the no-action alternative in Section 6.2.1.

Implementability

The construction of riparian corridors is technically and administratively feasible along the wetlands adjacent to Sites 11 and 30. The areas to be remediated are readily accessible, and the water table is high. Furthermore, these areas have limited site development potential, ensuring that this remedy can be applied as a long-term remedy. The planting of phreatophyte trees, however, may inhibit stormwater drainage from the wetlands. The hydraulic impact of the riparian corridor and the necessity of channel improvements in the wetlands would need to be evaluated in a conceptual design. Channel improvements are not considered in this evaluation.

The riparian corridor alternative would include pilot testing to determine the appropriate species of tree and soil amendments. Because at least eight species of poplar are indigenous to North America and because of their ability to form hybrids, it is expected that poplars can be cultivated in Pensacola. Trees are typically planted at a closely spaced interval in three parallel trenches. Because of the high water table, the trees may not need to be irrigated to become established. The riparian corridor would be closely monitored the first year to assure that the trees become established. In subsequent years, inspections would be performed to monitor the health of the trees and the effectiveness the remedy. The effectiveness of the riparian corridors at satisfying the RAOs must be continually monitored.

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. Additionally, per Navy guidance, the performance of remedial/removal systems that leave contamination onsite shall be evaluated at least annually to measure progress toward the remedial action objective (U.S. Navy, October 2003). This evaluation would include the spatial and temporal analyses of groundwater data to assess increasing, decreasing, or stationary trends in the concentrations of groundwater contaminants. This evaluation would be used to recommend continuation, increases, or decreases in the number of samples and types of analyses required to reevaluate the riparian corridors alternative in subsequent 5-year reviews.

Because 5-year reviews are considered in the media-specific RAAs for soil, they are not also estimated here.

Effectiveness

Riparian corridors are a relatively new technology, mainly used to remediate water soluble nutrients and pesticides. Poplars have been applied to mineralize atrazine and degrade chlorinated solvents. The effectiveness of this technology might be limited to easily assimilated and metabolized compounds, however.

Phreatophytes are particularly suited for hydraulic control. Young poplars were estimated to transpire 8 gallons per day (gpd), 5-year-old poplars can transpire 25 to 50 gpd, and maturephreatophyte trees can transpire 200 to 400 gpd (USEPA, February 2000). Because the shallow aquifer has such a high hydraulic conductivity, however, riparian corridors would have limited capability of hydraulically controlling the aquifer – the geometric mean of hydraulic conductivity in shallow OU 2 wells was 167.7 ft/day, as reported in RI.

Riparian corridors are not immediately effective. Although poplars are fast growing trees, they would probably require a year to become established. Thus, the riparian corridor alternative effectiveness increases with time. Many of the trees, however, will not reach maturity due to overcrowding, competition, and disease. Young trees may also be prone to damage by animals. Poplar trees also have a short lifespan of approximately 20 years.

Riparian corridors have a secondary advantage of stabilizing the stream bank, preventing erosion, and greatly improving the aquatic and terrestrial habitats.

Because the riparian corridors would be constructed adjacent to surface water receptors, the short-term exposure to site workers would be limited. The site worker exposure risks would be minimized through the use of proper PPE. Because earthwork would be performed adjacent to surface water bodies, it would be necessary to construct erosion controls such as silt fences along the riparian corridors.

Cost

Figure 6-4 shows the locations of the proposed riparian corridors. The total length of the riparian corridors is 3,240 feet, and the width is 60 feet. Prior to construction, these 4.5 acres would be cleared and grubbed to remove existing vegetation. The riparian corridors would be constructed by planting 1,674 3-foot whip trees and installing an irrigation system. The whips would be expected to quickly become established when properly fertilized while planting and when irrigated. Ten 2-inch monitoring wells would be constructed to a 15-foot depth to facilitate performance monitoring of the riparian corridors. Soil and groundwater samples would be collected annually and analyzed for VOCs and MNA parameters for 30 years. The riparian corridor would also be inspected annually to assess the health of the trees. The results of the sampling and inspection would be used to complete the annual performance reviews (U.S. Navy, October 2003).

The RACER summary costs for the riparian corridor alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for construction and operation, 3) the phase cost summary for design, and 4) the phase technology cost detail for long-term groundwater monitoring. The first-year cost of the riparian corridors alternative is $252,100, which includes design, construction, first-year operation, performance sampling, and long-term groundwater sampling and analysis. Performance and long-term groundwater sampling would continue for 30 years. When discounted at 6%, the total present value of the riparian corridors alternative is $1,843,700.

6.2.3 Alternative 3: Permeable Reactive Barrier and Riparian Corridors

Although riparian corridors would be protective of adjacent surface waters, they would not be applied to meet groundwater CTLs away from the adjacent wetlands. In Alternative 3, PRBs are added as a complementary component of Alternative 2, which treats the chlorinated solvent plume extending from the southeast corner of the Building 649 complex. Thus, Alternative 3 includes all of the components of Alternative 2, plus the construction of a PRB.

Zero-valent iron (ZVI) PRBs are typically applied to remediate dilute plumes of chlorinated solvents, or other oxidized contaminants, and are not typically used for source zone treatment. As chlorinated solvents interact with the PRB, the ZVI serves as a reductant for the reductive dechlorination of the chlorinated solvents, which oxidizes the iron. TCE degrades by the competing pathways of sequential hydrogenolysis and reductive β-elimination. In sequential hydrogenolysis, TCE degrades to DCE isomers, which may then degrade to VC and ethene. In reductive β-elimination, ZVI may degrade TCE to chloroacetylene (H–C≡C–Cl), then to acetylene (H–C≡C–H), then to ethene. The reductive β-elimination intermediate products are likely to be short lived. PRBs should be designed to provide sufficient contaminant residence time for intermediate products such as *cis*-1,2-DCE and VC to fully degrade to ethene. ZVI PRBs also have a secondary treatment mechanism. Several redox reactions produce hydroxide ions, which can raise the pH to more than 9 and promote the precipitation of many metal species. In poorly buffered groundwater, the pH has been reported to increase to 11.

In addition to providing sufficient residence time for contaminant degradation, PRBs have the contrasting objective of being a preferential conduit for contaminated groundwater flow. PRBs should ideally have a higher hydraulic conductivity than the surrounding formation. When the hydraulic conductivity of the PRB is less than the aquifer, groundwater may be preferentially directed around, under, or over the barrier. Groundwater flow under PRBs can be averted by keying the PRB into an underlying confining layer, which is estimated to exist at 25 to 40 feet bgl near Site 30. Nevertheless, the hydraulic conductivity of the aquifer is very high (the geometric mean of the hydraulic conductivity in shallow OU 2 wells was 167.7 ft/day), and the competency of the lower confining layer is unknown. Additionally, the hydraulic conductivity of the PRB is likely to degrade due to the precipitation of metals and the potential build-up of hydrogen gas, which is formed by the reaction of ZVI and water but would be moderated by biological activity. Because of these concerns, Gavaskar et al. (2000) recommend that the PRB should be at least five times as permeable as the surrounding aquifer in their PRB design guidance.

PRBs are frequently constructed as funnel-and-gate systems, where impermeable funnels direct groundwater through reactive ZVI permeable gates. When properly designed, the impermeable funnels increase the groundwater head and direct groundwater through the permeable gates at an increased velocity. Although this configuration can reduce the material costs for PRB construction, it is probably not appropriate at OU 2. Without a competent aquitard below the contaminated groundwater, the impermeable funnels would not direct groundwater through the PRB gates. Given the high hydraulic conductivity of the formation, the construction of a sufficiently permeable PRB would be difficult. Because of these constraints, the PRB would probably need to be constructed across the entire downgradient edge of contaminated zone and be keyed into the underlying confining zone.

The PRB and riparian corridors alternative includes post-active remediation monitoring, as specified in the no-action alternative in Section 6.2.1.

Implementability

The construction of a PRB is technically and administratively feasible near the Building 649 complex. The preferred location for the PRB is immediately downgradient of the Building 649 complex, along an equal potentiometric line, upgradient of Wetland 5A. This location extends across Murray Road and probably intersects underground utilities. If the PRB is constructed under Murray Road, the road would need to be temporary closed and repaved. The PRB could either be designed around the underground utilities, or the utilities could be re-routed. In addition to the construction of an impermeable barrier at the top of the PRB, the ground surface may need to be re-contoured to limit the infiltration of surface water into the PRB.

The PRB could be constructed by number of methods, including excavation and slurry trenching, deep soil mixing, and high pressure jetting. The construction method would be selected in the design, and would be dependent on the hydraulic and soil properties, the desired reactivity, the redundancy of downgradient protection, the presence and persistence of utilities, and the relative construction cost. PRBs are conventionally constructed in an excavated trench that is filled with bentonite slurry. While the trench is extended, reactive media is added to displace the slurry, such that approximately 300 feet of slurry mixture is reused for an elongated trench. This method may not be feasible, however, because flowing sands may collapse the slurry trench and the presence and persistence of underground utilities may make this method difficult to implement. Although deep soil mixing and high pressure jetting are less invasive methods of emplacement, they emplace less reactive media and do not ensure continuity of the PRB.

Once constructed, PRBs require minimal maintenance. The maintenance requirements would be limited to effectiveness monitoring, which may be used to evaluate the longevity of the PRB. Although the PRB would have a limited lifespan due to decreased reactivity and permeability, there is insufficient precedence to determine how long the PRB would remain sufficiently effective and when it should be replaced. The PRB would be expected to be effective for a minimum of 10 to 20 years, however. During this period, many pore volumes of groundwater would pass through the PRB, and the remaining contamination would presumably decrease due to attenuation processes. Thus, PRB replacement is not anticipated.

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. Additionally, per Navy guidance, the performance of remedial/removal systems that leave contamination onsite shall be evaluated at least annually to measure progress toward the remedial action objective (U.S. Navy, October 2003). This evaluation would include the spatial and temporal analyses of groundwater data to assess whether there are increasing, decreasing, or stationary trends in the concentrations of groundwater contaminants. This evaluation would be used to recommend continuation, increases, or decreases in the number of samples and types of analyses required to reevaluate the permeable reactive barrier and riparian corridors alternative in subsequent 5-year reviews. Because 5-year reviews are considered in the media-specific RAAs for soil, they are not also estimated here.

Effectiveness

The construction of a ZVI PRB would provide an additional level of effectiveness than riparian corridors do alone. Although riparian corridors are protective of surface waters, they do not address groundwater CTL exceedances away from the adjacent wetlands. Furthermore, riparian corridors require time to reach their maximum effectiveness and the effectiveness is uncertain. In contrast, PRBs are immediately effective at treating passing groundwater. Thus, the construction of a PRB would passively treat the most contaminated groundwater and provide an additional level of protection for surface waters.

Although ZVI PRBs effectively reduce the concentrations of many of the COPCs, they produce undesirable groundwater quality immediately downgradient of the PRB. The undesirable effects include increased pH, decreased dissolved oxygen, and ferrous iron leaching. Although these effects are generally limited to the groundwater immediately downgradient of the PRB, the aquifer resiliency is highly site specific. These conditions would not be expected to mobilize contamination but would stress the microbes and make the downgradient zone unfavorable for the oxidation and biodegradation of reduced hydrocarbons such as BTEX compounds. If the riparian corridor is situated downgradient of the PRB, it would amend the adverse effects, if any, before the groundwater is discharged to surface water.

Although the construction of the PRB would result in a short-term risk to site construction workers, this risk would be minimized through the use of proper PPE. Although earthwork may result in temporary, increased erosion to Wetland 5A, appropriate measures would be taken to minimize erosion. These measures may include silt fencing and hay bails, temporary and permanent run-on and runoff control, and re-seeding.

Cost

Figure 6-5 shows the locations of the proposed PRB and riparian corridors. The riparian corridor details and costs in this Alternative 3 are identical to Alternative 2 and are not repeated in this section. In this cost estimate, the PRB would be constructed using a conventional method of excavating a trench, securing it with a bentonite slurry, and displacing the slurry with reactive media. The PRB would be 720 feet long, 40 feet deep, and 2.5 feet wide. The lower 30 feet of the PRB would be constructed of 50% iron fillings and 50% pea gravel, and the top 10 feet of the PRB would be constructed of montmorillonite clay. Fifteen 2-inch monitoring wells would be constructed to a 40-foot depth on the downgradient side of the PRB to facilitate performance monitoring. Groundwater samples would be collected annually and analyzed for VOCs. The analytical results would be used to complete the annual performance review (U.S. Navy, October 2003).

The RACER summary costs for the PRB and riparian corridor alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for construction and operation, 3) the phase cost summary for design, and 4) the phase technology cost detail for long-term groundwater monitoring. The first-year cost of the PRB and riparian corridors alternative is $2,619,300, which includes design, construction, first-year operation, performance sampling, and long-term groundwater sampling. Performance and long-term groundwater sampling would continue for 30 years. When discounted at 6%, the total present value of the PRB and riparian corridors alternative is $4,694,500.

6.2.4 Alternative 4: Groundwater Pumping and Discharge to FOTW

Groundwater pumping is a conventional method for remediating groundwater and includes the processes of containment, removal, and treatment. Extraction wells are installed near contaminant hotspots to remove groundwater contamination. Pumping also has the capability of hydraulically containing groundwater contamination, which may prevent the seepage of contaminated groundwater into adjacent surface waters. Extracted groundwater is then treated and disposed.

The high permeability of the surficial sand and gravel aquifer may make the groundwater pumping alternative impracticable. In the RI, the geometric mean of the hydraulic conductivity was 167.7 ft/day for the shallow aquifer. When the hydraulic conductivity is large, the well yield is large and the radius of influence is limited. The well yield in fully penetrating wells in unconfined aquifers can be estimated using the Thiem equation for unconfined aquifers (Bouwer, 1978):

$$Q = \frac{\pi K\left(h_2^2 - h_1^2\right)}{\ln\left(r_2/r_1\right)}$$

In this equation, Q is the pumping rate, K is the hydraulic conductivity, r_1 and h_1 are the radius of well (3 inches) and the height of water above the bottom of the formation during pumping, and r_2 and h_2 are the assumed radius (50 feet) to the undisturbed water table and the undisturbed water table elevation (35-foot saturated thickness used). Although this calculation does not include well losses, these may reduce the estimated well yield by 1 to 2% for well-constructed extraction wells. In the surficial sand and gravel aquifer, the well yield is pump constrained, as opposed to formation constrained. Solutions to the Thiem equation for unconfined flow indicate that a 35.6 gallons per minute (gpm) pumping rate is needed to induce a 1-foot drawdown in the aquifer adjacent to the extraction well, a 70.2 gpm pumping rate is needed to induce a 2-foot drawdown, and 103.8 gpm pumping rate is needed to induce a 3-foot drawdown.

The radius of influence for the extraction well can be estimated using Boulton's equation for unconfined flow (Bouwer, 1978):

$$s = \frac{Q}{2\pi KH}\left(1 + C_k\right)V\left(t', r'\right)$$

$$t' = \frac{Kt}{SH}$$

$$r' = \frac{r}{H}$$

In this equation, s is the drawdown at radius r, H is the static water level, C_k is a correction factor that is a function of r', $V(t',r')$ is Boulton's well function, S is the storativity, and t is the elapsed pumping time. This equation is valid when the water height in the well is greater the $0.5H$. Figure 6-6 shows the solution to Boulton's equation after 7 days for unconfined flow when the extraction rate is 70 gpm. The discontinuity in this solution is a consequence of using the discrete solution to Bouton's well function, as given in Bouwer (1978). This solution yields a 0.60-foot drawdown 52 feet from the extraction well and a 0.34-foot drawdown 87 feet from the extraction well after 7 days of continuous pumping at 70 gpm.

In the conceptual evaluation of the groundwater pumping alternatives, groundwater contamination is addressed by pumping groundwater at a 70-gpm pump rate from multiple 6-inch extraction wells, which are presumed to have 100-foot radii of influence. The extraction well network would consist of 13 extraction wells, constructed to 25 feet bgl, on the downgradient perimeter of OU 2 to address groundwater discharging to surface water, and three extraction wells, constructed to 25 feet bgl, to treat the VOC source area in the Building 649 complex. Extraction wells would be spaced at an approximate 200-foot interval, which is estimated to hydraulically contain groundwater. The extraction well locations are shown in Figure 6-7, which are superimposed on the Phase III VOC GCTL exceedances, shown in Figure 4-19. As shown in Figure 4-16, there were limited Phase III SVOC GCTL exceedances, and these occurred in wells with VOC exceedances. Because monitoring wells 30GS111 and 30GI111 occur on the opposite side of Wetland 6, SVOC and VOC exceedances in these monitoring wells are not addressed in this remedy. The extraction well network would address the GCTL exceedances for barium, cadmium, chromium, and lead, which are shown in Figure 4-9, with the exception of marginal lead exceedance in monitoring well 30GS126, which is adjacent to Wetland 5B. The extraction well network would not address exceedances of secondary drinking water standards for inorganics, specifically aluminum, iron, and manganese, which are shown in Figure 4-8. Secondary drinking water standard exceedances are presumed to be attributed to natural background conditions.

Alternatives 4 and 5 differ only in the groundwater disposal option. In Alternative 4, groundwater is discharged directly to the FOTW, whereas in Alternative 5, groundwater is treated and discharged to the adjacent wetlands. Although Alternative 4 is favorable, the quality and quantity of extracted groundwater may exceed the FOTW's pretreatment standards or capacity. In other NAS Pensacola remediaton activities, the FOTW has both accepted and rejected extracted wastewater for treatment. If a sufficient percentage of brackish groundwater is extracted, the salinity of the water may be detrimental to the activated sludge at the FOTW. In Alternative 4, extracted groundwater would be routed through multiple trunk lines and discharged to the FOTW through the sanitary sewer system.

The groundwater pumping alternatives include post-active remediation monitoring, as specified in the no-action alternative in Section 6.2.1.

Implementability

The construction of the extraction well network and piping for FOTW discharge to the sanitary sewer is technically feasible at OU 2. However, it is not known whether the extracted groundwater would exceed the quality and quantity restrictions for FOTW disposal. In the conceptual groundwater pumping scenario, 16 extraction wells would be constructed and continuously pumped at 70 gpm, which produces at total continuous discharge of 1,120 gpm. This discharge quantity may exceed the treatment capacity of the FOTW. Additionally, four of the extraction wells are constructed within 150 feet of the tidally influenced Yacht Basin, and these wells may produce brackish water, which may be prohibited from the FOTW discharge.

The Navy is predisposed against the installation of new pump-and-treat remedies. The predisposition is because pump-and-treat remedies typically turn into long-term remedies, have trouble meeting the remedial action objectives, and are rarely optimized for maximum performance. The following is an excerpt from the *Navy/Marine Corps Policy for Optimizing Remedial and Removal Actions At All Installation Restoration and Munitions Response Program Sites* (U.S. Navy, October 2003):

> ***Special Technical Issue:*** Since 1998, Navy, other DoD Components, and the Environmental Protection Agency (EPA) have been conducting evaluations of the effectiveness of "pump and treat" systems to address groundwater contamination. Consensus of all parties is that pump and treat systems are rarely the optimal alternative for groundwater response actions. Therefore, any plans to install new pump and treat systems on Navy and Marine Corps installations requires approval from Headquarters (HQ) at the Naval Facilities Engineering Command (NAVFAC). This requirement applies to all "pump and treat" systems (remedial and removal actions) where groundwater is removed from the sub-surface by pumping or other means, treated above ground in any way, and discharged in any way (i.e. off site disposal, sewer systems, re-injected, etc.) In order to receive the NAVFAC HQ approval, the IR Manager shall forward a summary of the site background, the conceptual site model (CSM), the remedial action objectives, a listing of the technologies screened for the site, a summary of the alternatives analysis, and a statement of why "pump and treat" is the most appropriate technology to be used at the site, including a life cycle cost analysis (net present value and total site cost) and exit strategy. NAVFAC HQ will provide a written approval/dis-approval response to the IR Manager based on review of this submittal.

Although this policy does not preclude the application of a pump-and-treat remedy, it increases the burden for its implementation.

Groundwater pumping may turn into a *de facto* long-term remedy if remedial goals are not met. The operation of the groundwater pumps can be automated and telemetry installed to facilitate minimal O&M.

Groundwater monitoring must be continued after the termination of treatment, if applicable. A minimum of four groundwater sampling events are required, and site rehabilitation shall be considered complete when the no-further action criteria of 62-780.680(2), FAC, have been met for at least the last two sampling events [62-780.750(4)(f), FAC]. Because it is assumed that the groundwater pumping alternatives are *de facto* long-term remedies, however, groundwater monitoring is assumed for 30 years.

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. Additionally, per Navy guidance, the performance of remedial/removal systems that leave contamination onsite shall be evaluated at least annually to measure progress toward the remedial action objective (U.S. Navy, October 2003). This evaluation would include the spatial and temporal analyses of groundwater data to assess increasing, decreasing, or stationary trends in the concentrations of groundwater contaminants. This evaluation would be used to recommend continuation, increases, or decreases in the number of samples and types of analyses required to reevaluate the groundwater pumping and FOTW discharge alternative in subsequent 5-year reviews. Because 5-year reviews are considered in the media-specific RAAs for soil, they are not also estimated here.

Effectiveness

The groundwater pumping alternatives are effective for the containment, removal, and treatment of contamination groundwater. The 13 extraction wells proposed along the wetlands would prevent contaminated groundwater from discharging to the wetlands, and are thus protective of Class III surface waters. The three extraction wells proposed in the Building 649 complex would be used to remove the source area contamination, and would thus be protective of the future beneficial use of groundwater.

Cost

Figure 6-7 shows the locations of the 16 proposed extraction wells. The extraction wells are 6-inch PVC wells constructed to a depth of 25 feet. Groundwater is pumped from the wells into subsurface conveyance piping. The conveyance piping from the 16 extraction wells to the sanitary sewer is estimated to include 3,000 feet of pressure-rated piping. Because 13 of the extraction wells are located at topographic lows along the wetlands waterfront, this estimate includes two prefabricated 800,000-gpd lift stations. The cost estimates include O&M for 30 years. O&M activities include maintenance of the 16 groundwater pumps and two lift stations and the collection of monthly compliance samples for FOTW discharge.

The RACER summary costs for the groundwater pumping and FOTW discharge alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for construction, 3) the phase cost summary for design, 4) the phase technology cost detail for O&M, and 5) the phase technology cost detail for long-term groundwater monitoring. The first-year cost of the groundwater pumping and FOTW discharge alternative is $922,800, which includes design, construction, O&M, compliance sampling, and long-term groundwater sampling. O&M, compliance sampling, and long-term groundwater sampling would continue for 30 years. When discounted at 6%, the total present value of the groundwater pumping and FOTW discharge alternative is $3,228,900.

6.2.5 Alternative 5: Groundwater Pumping, Treatment, and Discharge to Wetlands

The groundwater pumping scenario in Alternative 5 is identical to Alternative 4 and is not repeated in this section. Alternative 5 differs in the disposal option for the extracted groundwater. Because the extracted groundwater may exceed the quality and quantity criteria for the FOTW, an independent treatment and disposal option is developed. Extracted groundwater would be primarily contaminated with VOCs but may also need treatment for SVOC and metal exceedances. The treatment scenario developed in this alternative includes air stripping as primary treatment and GAC as secondary treatment. Air stripping is a conventional method for removing chlorinated solvents and BTEX from extracted groundwater. Air stripping may also have limited effectiveness for SVOC and metals treatment, possibly through scaling processes. GAC would be required as secondary treatment, however, to remove residual SVOCs, VOCs, and metals from the waste stream. After primary treatment, extracted groundwater would be routed through sequential GAC canisters, and the water quality would be measured from a sample port in between the GAC canisters. This sample location guarantees that contaminant breakthrough could be observed and that appropriate measures such as GAC replacement can be performed. GAC replenishment and disposal would be performed offsite. After primary and secondary treatment, the treated groundwater would be discharged to the adjacent wetlands as a NPDES permitted discharge. Although vapor treatment may be required for the air stripper, preliminary calculations indicate that vapor treatment is not necessary. In 62-210.300(3)(a)38, FAC, Brownfield site remediation is exempted from permitting when the total VOCs in the air emissions from all onsite remediation equipment does not exceed 13.7 pounds per day. When VOCs are stripped from 1,120 gpm of groundwater, the average VOC concentration in the groundwater would have to exceed 1,020 micrograms per liter (µg/L) to exceed the 13.7 pounds per day criteria. As shown in Figure 4-19, the total VOC concentration exceeded this criterion in only one monitoring well — 30GS06 – which had a total VOC concentration of 1,310 µg/L. Because extracted groundwater is received from 16 wells and commingled prior to treatment, the air stripping unit would not be anticipated to exceed the criteria for air permitting.

Implementability

The groundwater pumping, treatment, and discharge to wetlands alternative is technically feasible at OU 2. The operation of the groundwater pumps, the air strippers, and the GAC canisters can be automated and telemetry installed to facilitate minimal O&M. Although this treatment system could be designed for minimal O&M, air strippers are prone to scaling from iron oxidation. Sequestering agents may be used to minimize scaling. Monthly O&M may be required to inspect the treatment system, replenish the sequestering agent, acid-wash the air stripper, and replace the GAC canister, as needed. Monthly maintenance may also be required to collect compliance samples for the discharge monitoring reports, as specified in the NPDES permit.

As discussed in Section 6.2.4, the Navy is predisposed against the installation of new pump-and-treat systems, and an additional level of scrutiny is required. Groundwater pumping may turn into a *de facto* long-term remedy if remedial goals are not met.

Groundwater monitoring must be continued after the termination of treatment, if applicable. A minimum of four groundwater sampling events are required and site rehabilitation shall be considered complete when the no-further-action criteria of 62-780.680(2), FAC, have been met for at least the last two sampling events [62-780.750(4)(f), FAC]. Because it is assumed that the groundwater pumping alternatives are *de facto* long-term remedies, however, groundwater monitoring is assumed for 30 years.

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. Additionally, per Navy guidance, the performance of remedial/ removal systems that leave contamination onsite shall be evaluated at least annually to measure progress toward the remedial action objective (U.S. Navy, October 2003). This evaluation would include the spatial and temporal analyses of groundwater data to assess whether there are increasing, decreasing, or stationary trends in the concentrations of groundwater contaminants. This evaluation would be used to recommend continuation, increases, or decreases in the number of samples and types of analyses required to reevaluate the groundwater pumping, treatment, and discharge to wetlands alternative in subsequent 5-year reviews. Because 5-year reviews are considered in the media-specific RAAs for soil, they are not also estimated here.

Effectiveness

The groundwater pumping alternatives are effective for the containment, removal, and treatment of contamination groundwater. The 13 extraction wells proposed along the wetlands would prevent contaminated groundwater from discharging to the wetlands, and are thus protective of Class III surface waters. The three extraction wells proposed in the Building 649 complex would be used to remove the source area contamination, and would thus be protective of the future beneficial use of groundwater.

Discharging the extracted groundwater to the wetlands would help maintain the existing water balance. As considered, approximately 1,120 gpm of groundwater would be extracted from the shallow sand and gravel aquifer. Most of this groundwater would normally discharge to the wetlands, and the pumping in extraction wells adjacent to the wetlands may actually drain Wetlands 5A and 5B. Thus, by discharging treated groundwater to the wetlands, the continued water balance of the wetlands would be maintained, which would protect the existing flora and fauna in the adjacent Wetlands 5A and 5B.

Cost

The groundwater pumping and conveyance aspects of Alternative 5 are identical to Alternative 4 and are not repeated in this section. Alternative 5 also includes air stripping and GAC treatment systems for the 1,120-gpm flow. The component details for the treatment system are provided in the RACER cost estimates in Appendix C. The cost estimates include O&M for 30 years. O&M activities include maintenance of the 16 groundwater pumps and two lift stations, maintenance of the air stripping and GAC treatment systems, and the collection of monthly compliance samples for NPDES discharge and vapor discharge from the air stripper.

The RACER summary costs for the groundwater pumping, treatment, and NPDES discharge alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for construction, 3) the phase cost summary for design, 4) the phase technology cost detail for O&M, and 5) the phase technology cost detail for long-term groundwater monitoring. The first-year cost of the groundwater pumping, treatment, and NPDES discharge alternative is $1,569,800, which includes design, construction, O&M, compliance sampling, and long-term groundwater sampling. O&M, compliance sampling, and long-term groundwater sampling would continue for 30 years. When discounted at 6%, the total present value of the groundwater pumping, treatment, and NPDES discharge alternative is $11,918,300.


YACHT BASIN
ASPHALT CAP 1
ASPHALT CAP 2
ASPHALT CAP 3
ASPHALT CAP 4
SOIL CAP 1
SOIL CAP 2
SOIL CAP 3
SOIL CAP 4
WETLAND 7
WETLAND 6
WETLAND 5A
WETLAND 5B
INSET
WAREHOUSE ROAD
A. CUNNINGHAM ST.
MURRAY ROAD
PAGE ROAD
FARRAR ROAD
PALLEN ROAD
CLAY ROAD
INDUSTRIAL ROAD
TAYLOR ROAD
LEGEND
SURFACE WATER BODY
BUILDING
TRENCH LOCATIONS/IDs
FENCE LINE
ROADS
SIDEWALKS
SOIL BORING LOCATION
PROPOSED ASPHALT CAP
PROPOSED SOIL COVER
PROPOSED AREAS TO BE EXCAVATED
160 0 160
SCALE FEET
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FIGURE 6-1
SOIL ALTERNATIVE 3
LOCATIONS OF SOIL COVERS AND ASPHALT CAPS
Dr by: K. WOOSLEY
Proj. Code: 0059-001
Ck by: C. TRIPP
App by: A. HARRIS
Sheet 1
Of 1
Date: 12JAN05
DWG Name: 0059001B044

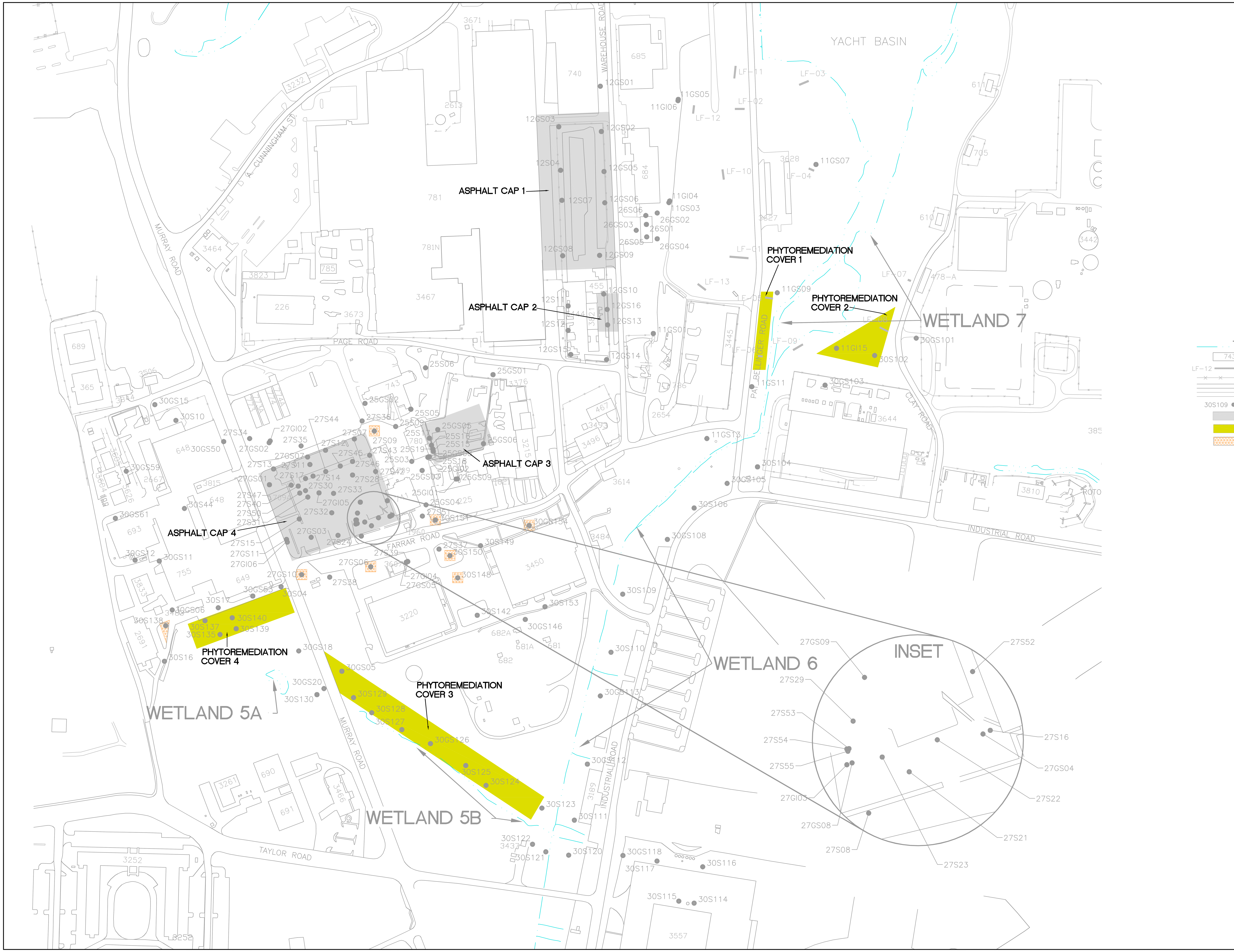

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FIGURE 6-2
SOIL ALTERNATIVE 4
LOCATIONS OF PHYTOREMEDIATION COVERS AND ASPHALT CAPS

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Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001B044	Of 1

LEGEND

- SURFACE WATER BODY
- 743 BUILDING
- LF-12 TRENCH LOCATIONS/IDs
- FENCE LINE
- ROADS
- SIDEWALKS
- 30S109 SOIL BORING LOCATION
- PROPOSED AREAS TO BE EXCAVATED

160 0 160
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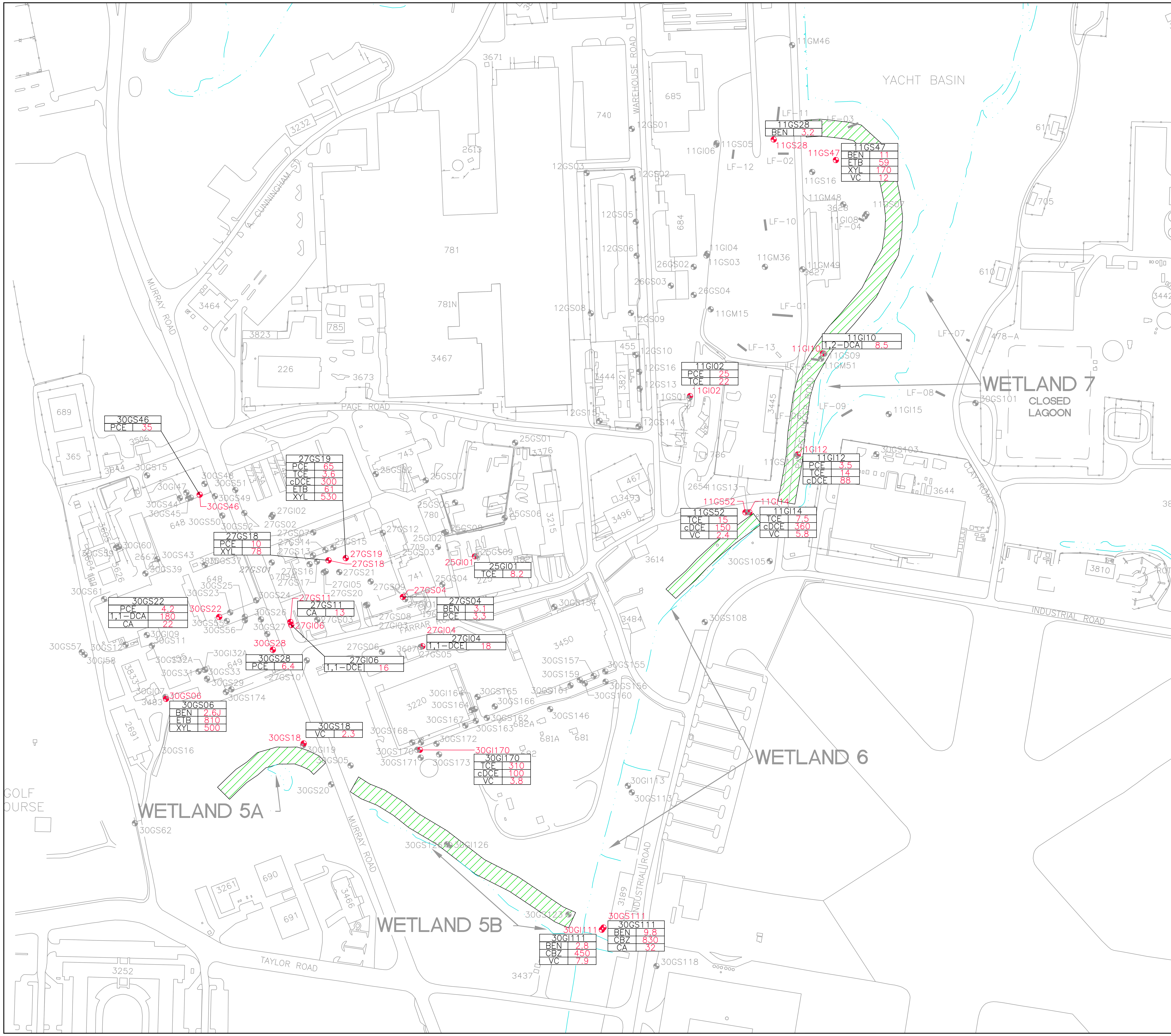
FIGURE 6-3
SOIL ALTERNATIVE 5
AREAS TO BE EXCAVATED

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001B045	Of 1



LEGEND

	SURFACE WATER BODY
743	BUILDING
	PROPOSED RIPARIAN CORRIDOR
LF-10	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
30GS155	SHALLOW OR INTERMEDIATE MONITORING WELL
30GS111	SHALLOW GROUNDWATER MONITORING WELL LOCATIONS/IDs WITH SAMPLE EXCEEDING THE GROUNDWATER CTL

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

VOC	FLORIDA GCTL (ppb)
Benzene (BEN)	1
Chlorobenzene (CBZ)	100
Chloroethane (CA)	13
Chloroform (CF)	76
1,1-Dichloroethane (1,1-DCA)	76
1,2-Dichloroethane (1,2-DCA)	3
1,1-Dichloroethene (1,1-DCE)	7
cis-1,2-Dichloroethene (cDCE)	70
Ethylbenzene (ETB)	30
Tetrachloroethene (PCE)	3
Trichloroethene (TCE)	3
Toluene (TOL)	40
Vinyl Chloride (VC)	1
Xylenes [Total] (XYL)	20

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER BILLION (PPB)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   GI = INTERMEDIATE GORUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE

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FIGURE 6-4
GROUNDWATER ALTERNATIVE 2
LOCATIONS OF RIPARIAN CORRIDORS

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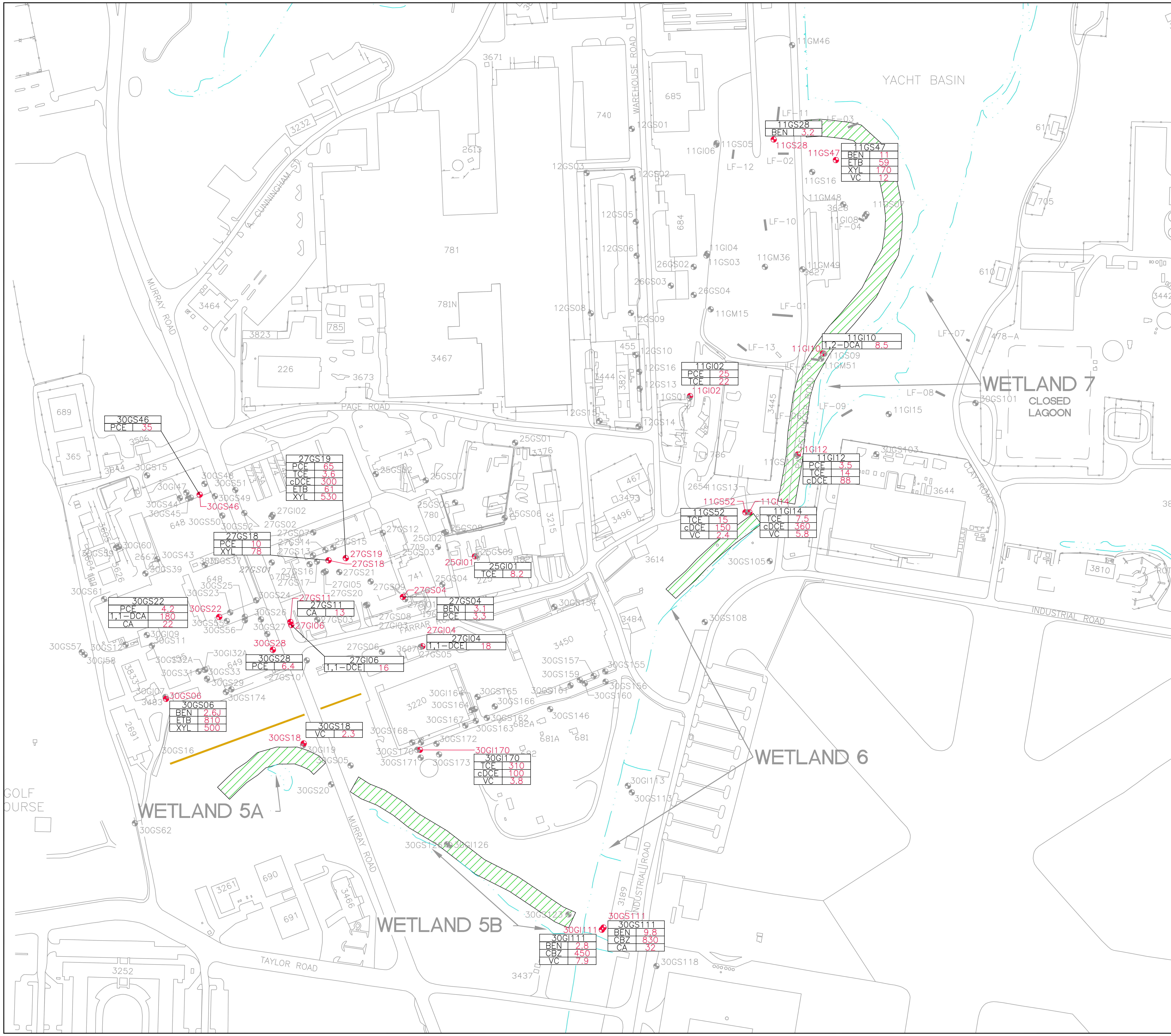
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W092	Of 1



LEGEND

(surface water line)	SURFACE WATER BODY
743	BUILDING
(hatched box)	PROPOSED RIPARIAN CORRIDOR
(orange line)	PROPOSED PERMEABLE REACTIVE BARRIER
LF–10	TRENCH LOCATIONS/IDs
(x line)	FENCE LINE
(lines)	ROADS
(lines)	SIDEWALKS
30GS155	SHALLOW OR INTERMEDIATE MONITORING WELL
30GS111	SHALLOW GROUNDWATER MONITORING WELL LOCATIONS/IDs WITH SAMPLE EXCEEDING THE GROUNDWATER CTL

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

VOC	FLORIDA GCTL (ppb)
Benzene (BEN)	1
Chlorobenzene (CBZ)	100
Chloroethane (CA)	13
Chloroform (CF)	76
1,1–Dichloroethane (1,1–DCA)	76
1,2–Dichloroethane (1,2–DCA)	3
1,1–Dichloroethene (1,1–DCE)	7
cis–1,2–Dichloroethene (cDCE)	70
Ethylbenzene (ETB)	30
Tetrachloroethene (PCE)	3
Trichloroethene (TCE)	3
Toluene (TOL)	40
Vinyl Chloride (VC)	1
Xylenes [Total] (XYL)	20

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER BILLION (PPB)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   GI = INTERMEDIATE GORUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE

160 0 160
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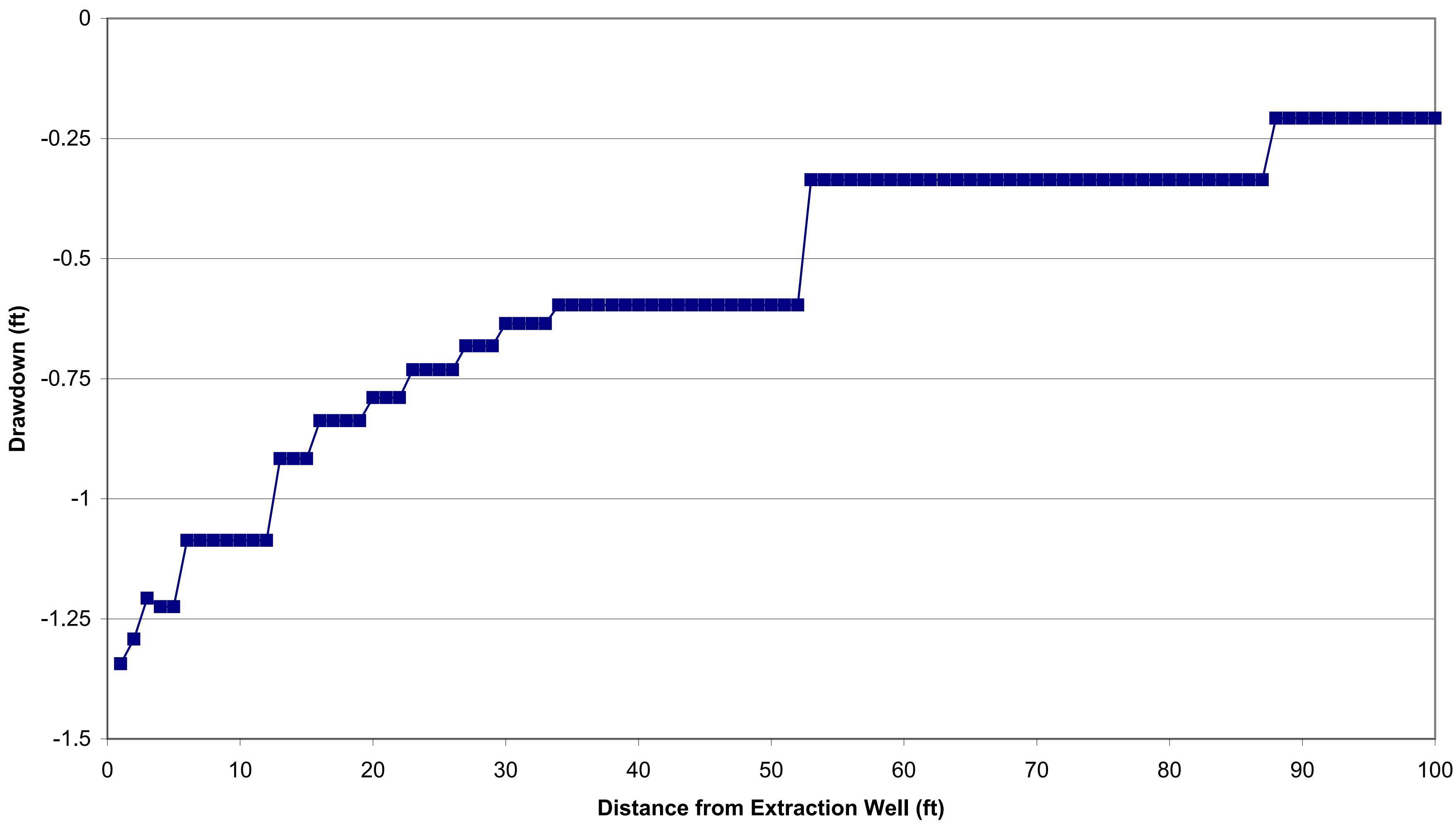
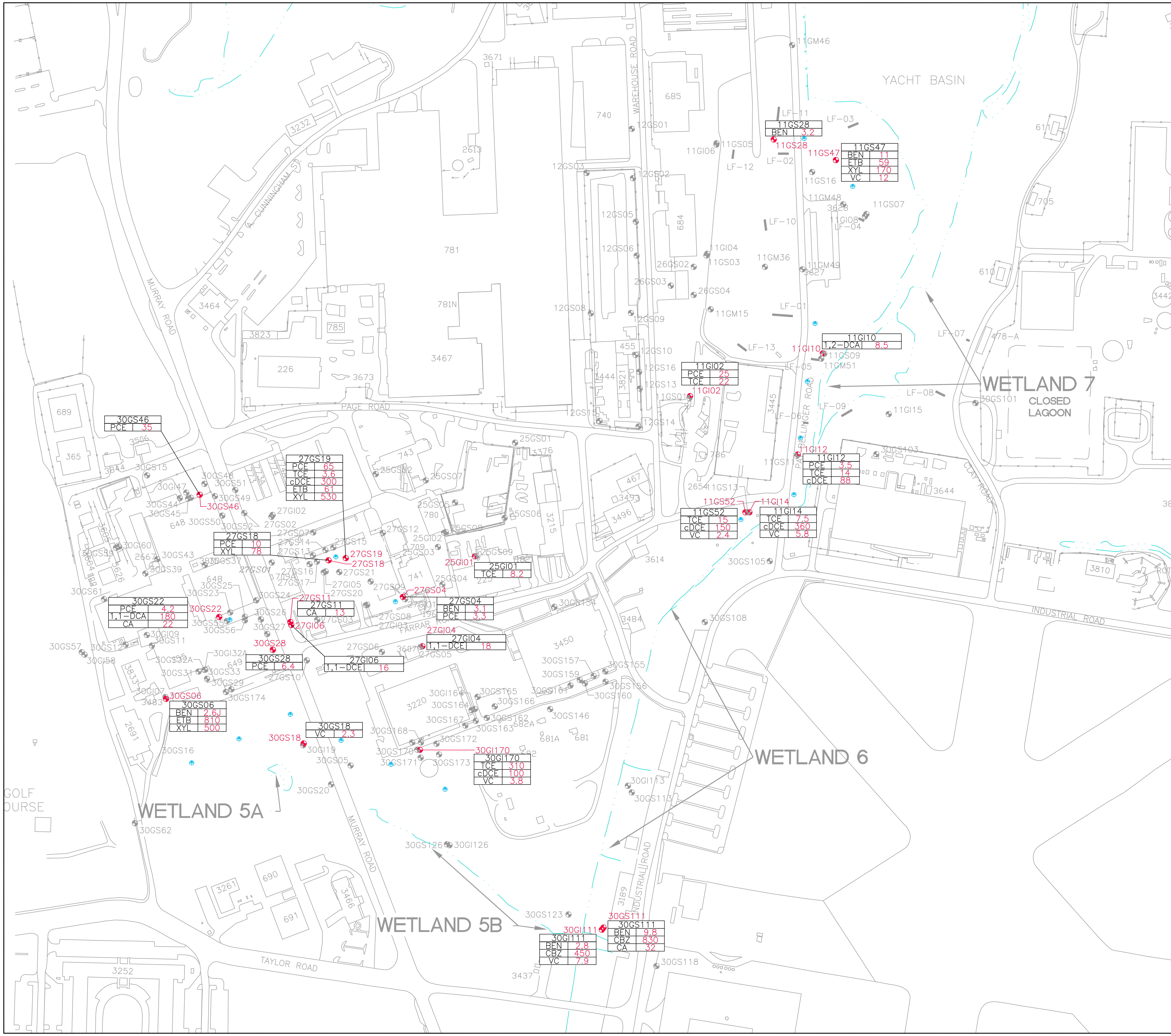
FIGURE 6–5
GROUNDWATER ALTERNATIVE 3
LOCATIONS OF RIPARIAN CORRIDORS
AND PERMEABLE REACTIVE BARRIER

Dr by: K. WOOSLEY	Proj. Code: 0059–001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W091	Of 1

Figure 6-6: Estimated Radius of Influence of 6-inch Extraction Well in Shallow Groundwater at OU 2 When Pumped at 70 GPM for 7 Days Solution to Boulton's Equation for Unconfined Flow of a Fully Penetrating Well





LEGEND

	SURFACE WATER BODY
743	BUILDING
LF-10	TRENCH LOCATIONS/IDs
	FENCE LINE
	ROADS
	SIDEWALKS
30GS155	SHALLOW OR INTERMEDIATE MONITORING WELL
30GS111	SHALLOW GROUNDWATER MONITORING WELL LOCATIONS/IDs WITH SAMPLE EXCEEDING THE GROUNDWATER CTL
	PROPOSED EXTRACTION WELL

SAMPLE ID	
PARAMETER KEY	CONCENTRATION

PARAMETER KEY

VOC	FLORIDA GCTL (ppb)
Benzene (BEN)	1
Chlorobenzene (CBZ)	100
Chloroethane (CA)	13
Chloroform (CF)	76
1,1-Dichloroethane (1,1-DCA)	76
1,2-Dichloroethane (1,2-DCA)	3
1,1-Dichloroethene (1,1-DCE)	7
cis-1,2-Dichloroethene (cDCE)	70
Ethylbenzene (ETB)	30
Tetrachloroethene (PCE)	3
Trichloroethene (TCE)	3
Toluene (TOL)	40
Vinyl Chloride (VC)	1
Xylenes [Total] (XYL)	20

NOTES

1. ALL CONCENTRATIONS ARE IN PARTS PER BILLION (PPB)
2. SAMPLE LOCATION AND ID LABEL DESCRIPTION:
   GS = SHALLOW GROUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE
   GI = INTERMEDIATE GORUNDWATER WELL SAMPLE WITH POSSIBLE SOIL BORING SAMPLE

160 0 160
SCALE FEET

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FIGURE 6-7
GROUNDWATER ALTERNATIVES 4 AND 5
LOCATION OF EXTRACTION WELLS

Dr by: K. WOOSLEY	Proj. Code: 0059-001	
Ck by: C. TRIPP	App by: A. HARRIS	Sheet 1
Date: 12JAN05	DWG Name: 0059001W090	Of 1

7.0 DETAILED ANALYSIS OF ALTERNATIVES

The detailed analysis of the alternatives consists of evaluating the alternatives based on the nine criteria stipulated in the NCP (40 CFR §300.430) and OSWER Directive 9355.3-01. The detailed analysis and presentation of pertinent information permits decision makers to adequately compare the alternatives, select an appropriate site remedy, and satisfy the CERCLA remedy selection requirements in the ROD.

7.1 Remedial Action Alternatives for Soil Contamination

The RAAs for soil contamination include the no-action alternative, institutional controls as a limited action alternative, surface capping as a control alternative, phytoremediation covers and selective asphalt capping as a treatment alternative, and excavation and offsite disposal as a removal alternative.

7.1.1 Alternative 1: No Action

The NCP requires that a no-action alternative be considered as a "baseline" for the evaluation of other alternatives. Under this alternative, no changes would be made to existing site operations. While the current and projected land use for this site is expected to remain industrial, there would be no additional institutional controls to guarantee the exposure pathway would remain industrial. Without institutional controls, the site would be managed under Risk Management Option Level I, pursuant to 62-780.680(1), FAC, and residential direct exposure CTLs would govern.

Threshold Criteria

Overall Protective of Human Health and the Environment

The no-action alternative is not effective at protecting human health, as contaminants above residential and C/I soil CTLs are left onsite. As shown in Figures 4-4, 4-10, and 4-13, there would be numerous metal, pesticide, and SVOC exceedances of the residential direct exposure CTL for potential future site residents. Residential development in some areas is unlikely, however. The Site 11 landfill and the land adjacent to Wetlands 7 and 64 would be undesirable for future residential development. As shown in Figures 4-6, 4-7, 4-12, 4-15, 4-17, and 4-18, the soil leachate

CTLs would be exceeded in several locations. Thus, soil contamination would likely continue to leach to groundwater in OU 2.

Compliance with ARARs

The no-action alternative is not compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780, and there are numerous residential and C/I direct exposure CTL exceedances and groundwater-based leachability CTL exceedances for soil based on the contaminant cleanup target levels established in 62-777, FAC. The no-action alternative does not invoke any action-specific ARARs.

Balancing Criteria

Long-Term Effectiveness and Permanence

The no-action alternative provides no long-term protection from residential or occupational exposure and does not limit the leaching of soil contamination into the surficial sand and gravel aquifer.

Reduction of Toxicity, Mobility, or Volume through Treatment

The no-action alternative does not reduce the toxicity, mobility, or volume of soil contamination. Contaminant toxicity reduction is limited to natural attenuation processes.

Short-Term Effectiveness

The no-action alternative provides no short-term protection from residential or occupational exposure and does not limit the leaching of soil contamination into the surficial sand and gravel aquifer.

Implementability

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. Therefore, the Navy would be required to perform a 5-year review to assess the adequacy of the no-action alternative.

Cost

The no-action alternative includes conducting six 5-year reviews. The default parameters in RACER are based on the *Comprehensive Five-Year Review Guidance* (USEPA, June 2001). The RACER cost summary reports for the no-action alternative are given in Appendix C. The cost summary reports include 1) the site cost over time report, 2) the phase technology cost detail report for 5-year review, and 3) the technology parameter report for 5-year review. The 5-year review tasks include the document review of the 5-year review check list and previous 5-year review reports; interviews with current and previous staff management, state and local government contacts; general site inspection and documentation; regulatory compliance inspection; report generation; and 2 days of travel. The estimated cost of the 5-year reviews is $16,600, multiplied by the escalation factor. The present value cost is calculated by discounting the site costs over time at a 6% discount rate. The present value cost of the no-action alternative is $53,200.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the no-action alternative will be established after the public comment period.

7.1.2 Alternative 2: Institutional Controls

This alternative would be limited to institutional controls, which would permit OU 2 to be managed using Risk Management Option Level II, pursuant to 62-780.680(2), FAC. This option permits soil to be evaluated using C/I direct exposure CTL and, although not included in this alternative, also permits the use of engineering controls for the management of onsite contamination.

Threshold Criteria

Overall Protective of Human Health and the Environment

The institutional controls alternative would not provide any additional effectiveness for the current use scenario, but would provide long-term effectiveness by restricting future use and access. As shown in Figures 4-5, 4-11, and 4-14, there would be numerous metal, pesticide, and SVOC exceedances of the C/I direct exposure CTL. Exposure to site workers would be minimized by proper notification and OSHA compliance. As shown in Figures 4-6, 4-7, 4-12, 4-15, 4-17, and 4-18, the soil leachate CTLs would be exceeded in several locations. Thus, soil contamination would likely continue to leach to groundwater in OU 2.

Compliance with ARARs

The institutional controls alternative is not compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780. Although the institutional controls alternative eliminates the residential direct exposure CTL criteria for soil, there are numerous C/I direct exposure CTL exceedances and groundwater-based leachability CTL exceedances for soil, based on the contaminant cleanup target levels established in 62-777, FAC. The institutional controls alternative does not invoke any action-specific ARARs.

Balancing Criteria

Long-Term Effectiveness and Permanence

The institutional controls alternative restricts the site use and access to industrial usage, but provides no long-term protection from occupational exposure and does not limit the leaching of soil contamination into the surficial sand and gravel aquifer. Occupational exposure (i.e., construction activities) would be minimized by proper notification and OSHA compliance.

Reduction of Toxicity, Mobility, or Volume through Treatment

The institutional controls alternative does not reduce the toxicity, mobility, or volume of soil contamination. Contaminant toxicity reduction is limited to natural attenuation processes.

Short-Term Effectiveness

The institutional controls alternative restrict the site use and access to industrial usage but provides no short-term protection from occupational exposure and does not limit the leaching of soil contamination into the surficial sand and gravel aquifer. Occupational exposure (i.e., construction activities) would be minimized by proper notification and OSHA compliance.

Implementability

NAS Pensacola currently operates as a C/I facility, and the base is not proposed for realignment or closure. Thus, C/I status can be achieved through the implementation of land-use control agreements to limit site access and property use. Annual compliance with the land-use control agreements may be necessary. In the event that the property was transferred and onsite contamination remains above applicable requirements, the Navy would be required to deed restrict OU 2 as C/I property. The Navy has qualified planners and attorneys who can develop and implement proper institutional controls for OU 2.

C/I direct exposure criteria are based on the intermittent exposure of adults, and are only appropriate when engineering or institutional controls proposed for the site would reliably restrict the exposure frequency and duration. Although construction workers do not fit the assumptions for residential exposure, FDEP requires that an institutional control specify that construction workers be notified of potential contamination, using residential direct exposure criteria, and that proper protective equipment should be utilized based on requirements from the OSHA (FDEP, 1999). Therefore, notification of the Base Environmental Office would be required to ensure proper notification and proper PPE for construction workers before invasive activities begin.

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. Therefore, the Navy would be required to perform a 5-year review to assess the adequacy of the institutional controls alternative.

Cost

The institutional controls alternative includes the planning and implementation of institutional controls and conducting six 5-year reviews. The default parameters in RACER are based on the *Comprehensive Five-Year Review Guidance* (USEPA, June 2001). The RACER cost summary reports for the institutional controls alternative are given in Appendix C. The cost summary reports include 1) the site cost over time report, 2) the phase technology cost detail report for institutional controls, 3) the technology parameter report for institutional controls, 4) the phase technology cost detail report for 5-year review, and 5) the technology parameter report for 5-year review. The institutional controls tasks include institutional analysis, plan development, processing agreement, plan execution, and deed notice. The 5-year review tasks include the document review of the 5-year review check list and previous 5-year review reports; interviews with current and previous staff management, state and local government contacts; general site inspection and documentation; regulatory compliance inspection; report generation; and 2 days of travel. The estimated cost of institutional controls is $21,900. The estimated cost of the 5-year reviews is $16,600, times the escalation factor. The present value cost is calculated by discounting the site costs over time at a 6% discount rate. The present value cost of the no-action alternative is $75,100.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the institutional controls alternative will be established after the public comment period.

7.1.3 Alternative 3: Soil and Asphalt Capping

The proposed surface capping areas are shown in Figure 6-1. Asphalt covers would be constructed in four distinct areas and soil covers would be constructed in four distinct areas. The capping locations are selected based on SCTL exceedances shown in Figures 4-5 to 4-7, 4-11, 4-12, 4-14, 4-15, 4-17, and 4-18. Table 6-1 describes the locations and dimensions of the proposed capping areas.

Although the proposed asphalt and soil caps are protective of most of the C/I direct exposure and leachability SCTL exceedances, several isolated exceedances occur near Sites 27 and 30. The isolated exceedances include sample locations 27GS06, 27GS10, 27S09, 30GS154, 30S138, 30S148, 30S150, and 30S151. These exceedances would be addressed by excavating the top 2 feet of soil from these locations and consolidating it under Site 27 asphalt cap. The total estimated excavation volume is 950 CY. Excavated soil would remain in the same area, and although not contiguous, may be managed as an area of contamination. Otherwise, the Site 27 asphalt cap would need to be constructed pursuant to the disposal CAMU regulations (40 CFR §264.552). Excavated areas would be recovered with clean fill. The proposed excavation areas are shown in Figure 6-1.

Threshold Criteria

Overall Protective of Human Health and the Environment

Surface capping reduces the risk of exposure to contaminated soil, thus eliminating the direct exposure pathway. When constructed as low permeability covers, surface capping also reduce infiltration, which permits higher CTLs to be calculated based on leachability criteria.

The construction of the asphalt caps also benefits the industrial usage of the site. The area of the proposed Site 25 asphalt cap is currently covered with interlocking, perforated metal sheets and is used for heavy vehicle parking. The area of the proposed Site 27 asphalt cap is currently used as a parking lot for light vehicles.

Compliance with ARARs

The soil and asphalt capping alternative is compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780. Institutional controls would be implemented to eliminate the residential direct exposure CTL criteria for soil and permit the soil to be managed under Risk Management Option Level II, 62-780.680(2), FAC, which permits no further action with institutional and engineering controls. Contaminated soil exceeding C/I direct exposure and groundwater-based leachability CTLs, as established in 62-777, FAC, would be capped in-place to reduce direct exposure and limit infiltration.

The soil and asphalt capping alternative may invoke action-specific ARARs related to the cap construction and discharge of stormwater. Action-specific ARARs relating to the cap construction may include:

- Corrective Action Management Units (40 CFR §264.552).

Action-specific ARARs relating to the management of stormwater may include the following:

- Clean Water Act NPDES (40 CFR §122, §125, §129, and §136)
- Regulations of Stormwater Discharge (Chapter 62-25, FAC)

Balancing Criteria

Long-Term Effectiveness and Permanence

Surface capping has limited long-term effectiveness and permanence, and the effectiveness depends on the future site use and structural durability of the soil and asphalt caps. Soil caps are prone to damage by erosion, vegetative perturbation, and geotechnical stability. Asphalt caps are prone to damage by inappropriate usage, geotechnical stability, weathering, and vegetative perturbation. The effect of these factors can be minimized through proper design and construction.

Reduction of Toxicity, Mobility, or Volume through Treatment

Surface capping is a control technology that does not reduce the volume or toxicity of waste. Surface capping provides reliable protection against the direct exposure to contaminated soils. When constructed as low permeability covers, they also reduce infiltration, which permits higher CTLs to be calculated based on leachability criteria, pursuant to 62-777, FAC, Figure 8.

Short-Term Effectiveness

Soil and asphalt caps have immediate effectiveness at reducing direct exposure and infiltration. Although site workers would be exposed during construction, occupational exposure would be minimized through the use of proper PPE and engineering controls. Because earthwork would be performed adjacent to surface water bodies, it would be necessary to construct erosion controls such as silt fences along the soil caps.

Implementability

The construction of soil and asphalt covers is technically feasible at OU 2, and the designated areas are amenable to the specified capping materials. Prior to the full-scale design and concurrent with construction activities, confirmation samples would need to be collected to verify that the contaminated soils are properly addressed by this remedy. The soil and asphalt caps would require periodic inspection. Soil caps would also require regular maintenance to minimize the erosion of the cap, and additional construction may be necessary if significant erosion of the cap is observed.

There are no concerns related to the availability of services and materials.

Because contamination would be left onsite, the soil and asphalt capping alternative includes the implementation of institutional controls. This permits OU 2 to be managed using Risk Management Option Level II, pursuant to 62-780.680(2), FAC. This option permits soil to be evaluated using C/I direct exposure CTLs and for surface capping to be used as an engineering control.

As stated in OSWER No. 9355.7-03B-P, 5-year reviews may no longer be needed when no hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure. Because soil and asphalt capping does not meet this criterion, 5-year reviews are included as a component of this alternative.

Cost

Figure 6-1 shows the locations of the proposed soil and asphalt caps. The asphalt caps would be constructed of hydraulic asphalt concrete, which is used as a hydraulic barrier. The asphalt thickness is 4 inches, which would be suitable for light vehicle traffic. The asphalt is underlain by 12 inches of base rock, a geotextile drainage fabric, and 6 inches of leveling fill. The soil covers would be constructed of 6 inches of topsoil, 12 inches of soil cover, 12 inches of compacted clay, and 6 inches of leveling fill. The asphalt and soil caps would be contoured to prevent the run-on of surface water and to direct the runoff into the storm sewer or onto adjacent grassy areas, as appropriate. The proposed locations would be cleared and grubbed and the debris would be disposed offsite.

The RACER cost summary reports for the soil and asphalt capping alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for asphalt caps, 3) the phase technology cost detail for soil caps, 3) the phase technology cost detail for excavation, 4) the phase technology cost detail for institutional controls, 5) the phase technology cost detail for 5-year reviews, and 6) the phase cost summary for design. The first-year cost of the soil and asphalt capping alternative is $2,654,000. Long-term costs include cap maintenance and conducting 5-year reviews, which are required when contamination is left onsite. The annual maintenance cost of the soil caps is $15,500, multiplied by the escalation factor. When discounted at 6%, the total present value of the soil and asphalt capping alternative is $3,412,500.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on the FS.

Community Acceptance

The status of community acceptance for the soil and asphalt capping alternative will be established after the public comment period.

7.1.4 Alternative 4: Phytoremediation Covers and Asphalt Capping

The phytoremediation covers and asphalt capping alternative is identical to the soil and asphalt capping alternative, except that phytoremediation covers are used instead of soil caps. Phytoremediation covers may be especially applicable near the adjacent wetlands, where surface capping is invasive and where site use is limited. Phytoremediation covers may also be more compatible with the selected groundwater RAA. Although phytoremediation covers may impede stormwater more than a soil cover, phytoremediation covers would be more resilient.

The locations of the proposed asphalt caps, phytoremediation covers, and areas to be excavated are shown in Figure 6-2. Asphalt covers would be constructed in four distinct areas, and phytoremediation covers would be constructed in four distinct areas. The capping locations are selected based on SCTL exceedances shown in Figures 4-5 to 4-7, 4-11, 4-12, 4-14, 4-15, 4-17, and 4-18.

Although the proposed asphalt and phytoremediation covers are protective of most of the C/I direct exposure and leachability SCTL exceedances, several isolated exceedances occur near Sites 27 and 30. The isolated exceedances include sample locations 27GS06, 27GS10, 27S09, 30GS154, 30S138, 30S148, 30S150, and 30S151. These exceedances would be addressed by excavating the top 2 feet of soil from these locations and consolidating it under Site 27 asphalt cap. The total estimated excavation volume is 950 CY. Excavated soil would remain in the same area, and although not contiguous, may be managed as an area of contamination. Otherwise, the Site 27 asphalt cap would need to be constructed pursuant to the disposal CAMU regulations (40 CFR §264.552). Excavated areas would be recovered with clean fill. The proposed excavation areas are shown in Figure 6-2.

Threshold Criteria

Overall Protective of Human Health and the Environment

Phytoremediation covers are designed for several purposes. Contaminants may be treated by rhizodegradation and phytotransformation processes, removed by phytoextraction, or controlled by phytostabilization and hydraulic control. As discussed in *Introduction to Phytoremediation*, several of the phytoremediation treatment processes are applicable to the organic and metal COPCs found in OU 2 (USEPA, February 2000). The treatment and removal mechanisms may be sufficient to reduce contamination to below C/I direct exposure and leachability-based SCTLs. Hydraulic control holds the moisture in place so that evapotranspiration processes limit the infiltration. When reduced infiltration rates are verified, it may be appropriate to calculate higher, remedy-specific leachability-based SCTLs, pursuant to 62-777, FAC, Figure 8.

Asphalt capping is a control technology that does not reduce the volume or toxicity of waste. Asphalt capping provides reliable protection against the direct exposure to contaminated soils. When constructed as low permeability covers, they also reduce infiltration, which permits higher CTLs to be calculated based on leachability criteria.

The construction of the asphalt caps also benefits the industrial usage of the site. The area of the proposed Site 25 asphalt cap is currently covered with interlocking, perforated metal sheets and is used for heavy vehicle parking. The area of the proposed Site 27 asphalt cap is currently used as a parking lot for light vehicles.

Compliance with ARARs

The phytoremediation cover and capping alternative is compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780. Institutional controls would be implemented to eliminate the residential direct exposure CTL criteria for soil and permit the soil to be managed under Risk Management Option Level II, 62-780.680(2), FAC, which permits no further action with institutional and engineering controls. Phytoremediation covers would be applied to treat and reduce infiltration in contaminated soils that exceed C/I direct exposure and groundwater-based leachability CTLs, as established in 62-777, FAC.

The phytoremediation covers and asphalt capping alternative may invoke action-specific ARARs related to the cap construction and the discharge of stormwater. Action-specific ARARs relating to the cap construction may include the following:

- Corrective Action Management Units (40 CFR §264.552)

Action-specific ARARs relating to the management of stormwater may include the following:

- Clean Water Act NPDES (40 CFR §122, §125, §129, and §136)
- Regulations of Stormwater Discharge (Chapter 62-25, FAC)

Balancing Criteria

Long-Term Effectiveness and Permanence

Phytoremediation covers are a treatment remedy and may reduce contamination levels to below CTLs. The permanence of low permeability soils also reduces the infiltration and leaching of contaminants. The permanence of the phytoremediation treatment and removal processes is dependent on the adaptability and permanence of the phytoremediation vegetation.

Asphalt capping has limited long-term effectiveness and permanence, and the effectiveness depends on the future site use and structural durability of the asphalt caps. Asphalt caps are prone to damage by inappropriate usage, geotechnical stability, weathering, and vegetative perturbation. The effect of these factors can be minimized through proper design, construction, and use.

Reduction of Toxicity, Mobility, or Volume through Treatment

Phytoremediation covers may reduce the toxicity, mobility, and volume of soil contamination, and may incorporate the processes of hydraulic control, phytodegradation, rhizodegradation, phytovolatilization, and perhaps phytoextraction. These processes are described in Section 6.1.4. The degree of treatment, removal, and control is uncertain, and must be continually assessed to determine whether RAOs are satisfied. Phytoremediation covers meet the statutory preference for treatment.

Asphalt capping is a control technology that does not reduce the volume or toxicity of waste. Asphalt capping provides reliable protection against the direct exposure to contaminated soils.

When constructed as low permeability covers, caps also reduce infiltration, which permits higher CTLs to be calculated based on leachability criteria, pursuant to 62-777, FAC, Figure 8.

Short-Term Effectiveness

When constructed with lower permeability soils, phytoremediation covers have short-term effectiveness at reducing contaminant leaching. The irrigation and application of nutrients may biostimulate indigenous microbes, which are capable of bioremediation. The phytoremediation processes become more effective as the phytoremediation vegetation becomes more established.

Asphalt caps have immediate effectiveness at reducing direct exposure and infiltration.

Although site workers would be exposed during construction, occupational exposure would be minimized through the use of proper PPE and engineering controls. Because earthwork would be performed adjacent to surface water bodies, it would be necessary to construct erosion controls such as silt fences along the phytoremediation covers.

Implementability

The construction of phytoremediation covers is technically feasible at OU 2. The designated areas adjacent to Wetlands 5A and 5B and the Yacht Basin are in undeveloped areas and are amenable to phytoremediation covers. This alternative would continue to include asphalt capping in areas designated in Figure 6-2. Prior to the full-scale design and concurrent with construction activities, confirmation samples would need to be collected to verify that the contaminated soils are properly addressed by this remedy. The phytoremediaton covers would require regular maintenance to maintain a vegetative presence and possibly to harvest plants designed for phytoextraction.

Pilot-testing is needed to facilitate the final design of the phytoremediaton cover. The purpose of the pilot test would be to identify and verify that appropriate plants can be grown in the site soils. These studies are typically performed using samples of site soil in which the prospective vegetation is grown in an offsite greenhouse. Pilot studies are also used to determine the nutrient amendments needed for successful application.

The construction of asphalt covers is technically feasible at OU 2 and may have benefits to the industrial usage of the site. Prior to the full-scale design and concurrent with construction activities, confirmation samples would need to be collected to verify that the contaminated soils are properly addressed by this remedy. The asphalt caps would require periodic inspection.

Although phytoremediation is a fairly new technology, there are no concerns related to the availability of services and materials. There are also no concerns for asphalt capping.

Because contamination would be left onsite, the phytoremediation covers and asphalt capping alternative includes the implementation of institutional controls. This permits OU 2 to be managed using Risk Management Option Level II, pursuant to 62-780.680(2), FAC. This option permits soil to be evaluated using C/I direct exposure CTLs and for phytoremediation covers and asphalt capping to be used as engineering controls.

As stated in OSWER No. 9355.7-03B-P, 5-year reviews may no longer be needed when no hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure. Asphalt capping does not meet this criterion. Although phytoremediaton covers provide stimulated treatment and hydraulic control, contamination would likely remain onsite. Thus, 5-year reviews are included as a component of this alternative.

Cost

The asphalt caps would be constructed of hydraulic asphalt concrete, which is used as a hydraulic barrier. The asphalt thickness is 4 inches, which would be suitable for light vehicle traffic. The asphalt is underlain by 12 inches of base rock, a geotextile drainage fabric, and 6 inches of leveling fill. The asphalt caps would be contoured to prevent the run-on of surface water and to direct the runoff into the storm sewer or onto adjacent grassy areas, as appropriate. The proposed locations would be cleared and grubbed and the debris would be disposed offsite.

The phytoremediation covers would consist of the selected phytoremediation vegetation and would include the construction of an irrigation and nutrient amendment system. The proposed locations would be cleared and grubbed and the debris would be disposed offsite. The phytoremediation covers would be actively managed for 10 years. Active management includes irrigation and nutrient amendment, replanting, inspection, mowing/maintenance, and natural attenuation monitoring.

The RACER cost summary reports for the phytoremediation cover and asphalt capping alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for asphalt caps, 3) the phase technology cost detail for phytoremediation covers, 4) the phase technology cost detail for O&M, 5) the phase technology cost detail for excavation, 6) the phase technology cost detail for institutional controls, 7) the phase technology cost detail for 5-year reviews, and 8) the phase cost summary for design. The first-year cost of the phytoremediation cover and asphalt capping alternative is $2,117,500. Natural attenuation sampling would be conducted for 10 years, with an annual cost of $18,700, multiplied by the escalation factor. Phytoremediation O&M would be conducted for 30 years, with an annual cost of $31,400, multiplied by the escalation factor. Long-term costs also include conducting 5-year reviews, which are required when contamination is left onsite. When discounted at 6%, the total present value of the phytoremediation cover and asphalt capping alternative is $2,847,700.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the phytoremediation cover and asphalt capping alternative will be established after the public comment period.

7.1.5 Alternative 5: Excavation and Offsite Disposal

This alternative involves excavating surface soil that exceeds C/I direct exposure CTLs and vadose zone soil that exceeds leachability CTLs based on groundwater. Figure 6-3 shows the proposed areas for excavation. These are based on CTL exceedances shown in Figures 4-5 to 4-7, 4-11, 4-12, 4-14, 4-15, 4-17, and 4-18. When soil contamination appears contiguous, larger areas of soil would be excavated. In cases were the soil contamination appears isolated, surgical excavation would be performed in 40-foot x 40-foot sections. The proposed areas of excavation would be excavated to 2 feet bgl, and subsurface soil contamination is not addressed.

Subsurface CTLs were only exceeded in three locations. In sample 30S013820, the sample depth was 20 feet bgl and presumably below the water table, and thus excluded from consideration. In sample 011S001506, total chromium concentration was 48 µg/kg, which slightly exceeded the hexavalent chromium leachability CTL of 38 µg/kg. Because most of the chromium presumably exists as trivalent chromium, this was excluded from consideration. In sample 011S000606, the concentration of PCE was 30 µg/kg, which was equal to leachability CTL of 30 µg/kg. This sample was also excluded from consideration.

The excavated soils would be disposed offsite. Although the excavated soils would not be characteristic of hazardous waste, they may include listed hazardous waste. If the excavated soils are determined to contain listed hazardous waste above health-based limits, the excavated soils would be hazardous waste because of the contained-in policy. FDEP's August 21, 2002, memorandum on "Management of Contaminated Media Under RCRA" explicitly states that the health-based limits are residential soil CTLs. Because soils would be excavated based on C/I CTLs, it is assumed in this FS that the excavated soils would be hazardous waste. Thus, if the excavated soils are disposed offsite, they must be disposed in a RCRA Subtitle D landfill. Although the excavated soils could also be disposed in an onsite disposal CAMU, this option was not explored in this FS.

Hazardous waste is subject to the LDRs. When soil contamination exceeds 10 x UTS, as defined in 40 CFR §268.48, the soil must be treated prior to land disposal. As discussed in Section 5.2.1, a detection of endrin aldehyde in sample 025S001600 was the only analyte found to exceed both risk and treatment criteria, and its exceedance was marginal. The concentration of endrin aldehyde would be anticipated to incidentally attenuate to below risk and/or treatment criteria, either before or after excavation. Although no metals were identified to exceed the TCLP LDR criteria, sample locations listed in Table 5-3 may need further evaluation to assess the pretreatment necessity.

Threshold Criteria

Overall Protective of Human Health and the Environment

Soils that exceed C/I direct exposure and groundwater-based leachability CTLs would be excavated and disposed offsite. Thus, excavation and offsite disposal are protective of human health and the environment.

Compliance with ARARs

The excavation and offsite disposal alternative is compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780. Institutional controls would be implemented to eliminate the residential direct exposure CTL criteria for soil and permit the soil to be managed under Risk Management Option Level II, 62-780.680(2), FAC, which permits no further action with institutional and engineering controls. Contaminated soil exceeding C/I direct exposure and groundwater-based leachability CTLs, as established in 62-777, FAC, would be excavated and disposed offsite.

The excavation and offsite disposal alternative may invoke action-specific ARARs related to the generation and disposal of hazardous waste in soil and the discharge of stormwater. Action-specific ARARs relating to the generation and disposal of hazardous waste in soil may include the following:

- RCRA Identification of Hazardous Waste (40 CFR §261)

- RCRA Generator Standards (40 CFR §262)

- RCRA Facility Standards (40 CFR §264)
- RCRA Land Disposal Restrictions (40 CFR §268)
- Department of Transportation Rules for the Transport of Hazardous Substances (49 CFR Parts §107 and §171-179)
- Toxic Substance Control Act (40 CFR §761 Subpart D, Storage and Disposal)

Action-specific ARARs relating to the management of stormwater may include the following:

- Clean Water Act NPDES (40 CFR §122, §125, §129, and §136)
- Regulations of Stormwater Discharge (Chapter 62-25, FAC)

Balancing Criteria

Long-Term Effectiveness and Permanence

Excavation and offsite disposal has long-term effectiveness and permanence as a remediation technology because contamination is removed from the site. Excavation may be less effective than a capping alternative, however, because all contamination may not be removed using surgical excavation, which is biased towards sampled locations.

Reduction of Toxicity, Mobility, or Volume through Treatment

Although excavation and offsite disposal removes the soil contamination, it does not incorporate treatment processes. Because LDRs are not anticipated to be exceeded, based on the evaluation in Section 5.2.1, ex-situ soil treatment is not necessary prior to land disposal.

Short-Term Effectiveness

Excavation and offsite disposal are immediately protective of human health and the environmental because contaminated soils are removed from the site. Excavation may be less effective than a capping alternative, however, because all contamination may not be removed using surgical excavation, which is biased towards sampled locations.

Although site workers would be exposed during excavation and loading activities, occupational exposure would be minimized through the use of proper PPE and engineering controls. Because earthwork would be performed adjacent to surface water bodies, it would be necessary to construct erosion controls such as silt fences along the areas proposed for excavation.

Implementability

Excavation and offsite disposal is technically and administratively feasible at OU 2. Excavation is performed frequently and is a reliable method to remove contaminated soil within given boundaries. The excavated soil volume is not anticipated to be sufficient to impose landfill capacity limitations.

Because contamination exceeding residential direct exposure CTLs would be left onsite, the excavation and offsite disposal alternative includes the implementation of institutional controls. This permits OU 2 to be managed using Risk Management Option Level II, pursuant to 62-780.680(2), FAC.

As stated in OSWER No. 9355.7-03B-P, 5-year reviews may no longer be needed when no hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure. With the implementation of institutional controls, this criterion is satisfied for soil. Thus, 5-year reviews are not needed as a component of this alternative. Nevertheless, groundwater contamination would be left onsite. In the media-specific RAAs in this FS, 5-year reviews are included in the soil remedies. Thus, 5-year reviews are included in the excavation and offsite disposal alternative.

Cost

The 246,400 square feet of contaminated surface soil, as identified in Figure 6-3, would be excavated to 2-foot bgl. Because direct exposure criteria is not applicable below 2 feet, base samples would not be collected. In this cost estimate, side-wall samples are also not considered. This cost estimates includes the collection and analysis of 40 samples for waste characterization. The samples would be analyzed for metal, pesticides/PCBs, SVOCs, VOCs, and TCLP metals, SVOCs, and VOCs. The 18,252 CY of excavated soil would be disposed offsite as hazardous waste. This estimate assumes that the excavated soil would be transported 200 miles to RCRA Subtitle D landfill in Emelle, AL. The RACER estimated disposal fee of $185.64/CY is the primary cost-driver for this alternative. Chemical Waste Management was contacted to confirm that this unit rate is appropriate for hazardous waste disposal in Emelle, Alabama.

The RACER cost summary reports for the excavation and offsite disposal alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and present value, 2) the phase technology cost detail for excavation, transport, and disposal, 3) the phase technology cost detail for institutional controls, and 4) the phase technology cost detail for 5-year reviews. The first- year cost of the excavation and offsite disposal alternative is $4,996,300. Long-term costs are limited to conducting 5-year reviews, which are required when contamination is left onsite. When discounted at 6%, the total present value of the excavation and offsite disposal alternative is $5,049,500.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the excavation and offsite disposal alternative will be established after the public comment period.

7.2 Remedial Action Alternatives for Groundwater Contamination

The RAAs for groundwater contamination include the no-action alternative, riparian corridors and PRBs as treatment alternatives, and groundwater pumping as a removal and control alternative.

Groundwater remedies are inherently long-term and contamination is usually left onsite. Thus, 5-year reviews are an appropriate component of all of the groundwater RAAs. Because 5-year reviews are considered in the media-specific RAAs for soil, however, they are not also estimated for the groundwater RAAs. Similarly, the inclusion of institutional controls would be redundant and they are not included as a component in the groundwater RAAs.

7.2.1 Alternative 1: No Action

The NCP requires that a no-action alternative be considered as a "baseline" for the evaluation of other alternatives. The no-action alternative does not include any remedial action or institutional controls, but does include groundwater monitoring. Groundwater monitoring shall be performed pursuant to 62-780.750, FAC, *Post Active Remediation Monitoring*. The sampling requirements include the following:

- At least one well sampled at the downgradient edge of the plume.
- At least one well sampled in the area(s) of highest groundwater contamination.
- Groundwater sampled quarterly, or at approved interval.
- Samples analyzed for contaminants present prior to the initiation of active remediation.

Using this standard, six wells are selected as candidates for long-term monitoring. The candidate monitoring wells were selected based on the groundwater CTL exceedances for SVOCs, VOCs, and metals, which are shown in Figures 4-9, 4-16, and 4-19. The candidate monitoring wells and analytical parameters are given in Table 6-2. Long-term monitoring would be conducted for 30 years.

Threshold Criteria

Overall Protective of Human Health and the Environment

The no-action alternative provides no protection of human health or the environment. Although the surficial zone of the sand and gravel aquifer currently has no beneficial use, groundwater contamination may continue to exceed ingestion criteria, as shown in Figures 4-9, 4-16, and 4-19. Groundwater may continue to discharge to the adjacent wetlands at concentrations exceeding the

Class III surface water standards. Class III surface water criteria are protective of recreational use and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Although groundwater contamination exceeds Class III surface water criteria in several monitoring wells adjacent to the wetlands, no surface water CTL exceedances have been observed in the wetlands. The decrease in contamination is likely due to dilution, volatilization, and other attenuation processes.

Compliance with ARARs

The no-action alternative is not compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780 and there are numerous GCTL exceedances for ingestion (lifetime excess cancer risk of 1E-06), as established in 62-777, FAC. Additionally, the contaminant concentrations in several monitoring wells adjacent to Wetlands 5A, 5B, 6, and 7 exceed CTLs for Class III fresh and marine surface waters. The no-action alternative does not invoke any action-specific ARARs.

Balancing Criteria

Long-Term Effectiveness and Permanence

The no-action alternative provides no long-term protection to the surficial sand and gravel aquifer or the adjacent wetlands.

Reduction of Toxicity, Mobility, or Volume through Treatment

The no-action alternative does not reduce the toxicity, mobility, or volume of groundwater contamination. Contaminant toxicity reduction is limited to natural attenuation processes.

Short-Term Effectiveness

The no-action alternative provides no short-term protection to the surficial sand and gravel aquifer or the adjacent wetlands.

Implementability

The NCP requires any alternative that leaves contamination onsite be reevaluated every 5 years to ensure its adequacy. This evaluation would include the spatial and temporal analyses of groundwater data to assess whether there are increasing, decreasing, or stationary trends in the concentrations of groundwater contaminants. This evaluation would be used to recommend continuation, increases, or decreases in the number of samples and types of analyses required to reevaluate the no-action alternative in subsequent 5-year reviews. Because 5-year reviews are considered in the media-specific RAAs for soil, they are not also estimated here.

Cost

The groundwater no-action alternative does not include conducting 5-year reviews because it would be redundant with the estimate for the soil no-action alternative shown in Section 6.1.1. The groundwater no-action alternative does include quarterly groundwater sampling of six monitoring wells with quality control samples. These are sampled using a low-flow sampling protocol and analyzed for the parameters listed in Table 6-2. The RACER summary costs for the groundwater no-action alternative are given in Appendix C. The cost summary reports include 1) the site cost over time and 2) the phase technology cost detail for long-term groundwater monitoring. The annual cost of groundwater monitoring is $55,200 multiplied by the escalation factor. The present value cost is calculated by discounting the site costs over time at a 6% discount rate. The present value cost of the groundwater no-action alternative is $983,800.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the no-action alternative will be established after the public comment period.

7.2.2 Alternative 2: Riparian Corridors

The riparian corridors alternative would not directly address groundwater exceedances in the industrial, developed areas of OU 2. In these areas, groundwater contamination would be permitted to naturally attenuate. Riparian corridors would be planted along the banks of the adjacent wetlands near Sites 11 and 30, as shown in Figure 6-4. The intended purpose of the riparian corridors would be to protect the surface water receptors by treating and removing groundwater contamination and by potentially limiting the infiltration of groundwater into surface water by transpiring the groundwater into the trees.

The riparian corridors alternative includes post-active remediation monitoring, as specified in the no-action alternative in Section 6.2.1. The groundwater data would be analyzed in the 5-year reviews. Because 5-year reviews are considered in the soil RAAs, they are not independently considered in this alternative.

Threshold Criteria

Overall Protective of Human Health and the Environment

Riparian corridors are a relatively new technology and they have mainly been used to remediate water soluble nutrients and pesticides. Poplars have been applied to mineralize atrazine and degrade chlorinated solvents. The effectiveness of this technology might be limited to easily assimilated and metabolized compounds, however.

Phreatophytes are particularly suited for hydraulic control. Because the shallow aquifer has such a high hydraulic conductivity, however, riparian corridors/buffer strips would have limited capability of hydraulically controlling the aquifer — the geometric mean of hydraulic conductivity in shallow OU 2 wells was 167.7 ft/day, as reported in RI.

Riparian corridors are not immediately effective. Although poplars are fast growing trees, they would probably take a year to become established. Thus, the riparian corridors alternative effectiveness increases with time. Many of the trees, however, will not reach maturity due to overcrowding, competition, and disease. Young trees may also be prone to damage by animals. Poplar trees also have a short lifespan of approximately 20 years.

Riparian corridors have a secondary advantage of stabilizing the stream bank and preventing erosion. They also greatly improve the aquatic and terrestrial habitats.

Compliance with ARARs

The riparian corridors alternative is compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780. Groundwater would be managed under Risk Management Option Level II, 62-780.680(2), FAC, which permits no further action with institutional and engineering controls, where the riparian corridors would be considered the engineering control. The riparian corridors alternative would provide limited treatment, removal, and containment of groundwater discharging to surface waters, and the effectiveness of the remedy would need to be continually monitored. Although the riparian corridors alternative does not address GCTL exceedances based on ingestion (lifetime excess cancer risk of 1E-06), as established in 62-777, FAC, the groundwater currently has no beneficial use.

The riparian corridors alternative may invoke action-specific ARARs related to the discharge of stormwater. Action-specific ARARs relating to the management of stormwater may include the following:

- Clean Water Act NPDES (40 CFR §122, §125, §129, and §136)
- Regulations of Stormwater Discharge (Chapter 62-25, FAC)

Balancing Criteria

Long-Term Effectiveness and Permanence

Riparian corridors may achieve long-term effectiveness and permanence with very little long-term oversight. Mature phreatophyte trees develop a root structure that intersects the groundwater to surface water pathway interface, which facilitates phytoremediaton processes for the treatment, removal, and control of groundwater contamination. Because the degree of treatment is uncertain, the ability of riparian corridors to achieve the RAOs must be continually assessed. Riparian corridors also stabilize stream banks, reduce erosion, and provide terrestrial and aquatic habitats, which is protective of the flora and fauna at the site. The long-term effectiveness of riparian corridors is hindered by the approximate 20-year lifespan of the poplars.

Reduction of Toxicity, Mobility, or Volume through Treatment

Riparian corridors apply phytoremediation processes to reduce the toxicity, mobility, and volume of groundwater contamination. Riparian corridors incorporate the phytoremediation processes of hydraulic control, phytodegradation, rhizodegradation, phytovolatilization, and perhaps phytoextraction. These processes are described in Section 6.1.4. The degree of treatment, removal, and control is uncertain, and must be continually assessed to determine whether RAOs are satisfied. Riparian corridors meet the statutory preference for treatment.

Short-Term Effectiveness

Riparian corridors have limited short-term effectiveness. In this alternative, the phytoremediation trees would be planted as closely spaced 3-foot whip trees (one tree per 116 square feet). The growth of the trees would be stimulated by adding specialized soil nutrients and then irrigating them with nutrient amended water. The nutrients may also biostimulate indigenous microbes capable of bioremediate processes. Because of the high water table, the trees may start influencing the groundwater after 1 to 2 years. Young poplars were estimated to transpire 8 gpd, 5-year-old poplars can transpire 25 to 50 gpd, and mature phreatophyte trees can transpire 200 to 400 gpd (EPA/600/R-99/107). Thus, the riparian corridors alternative effectiveness increases with time.

Because the riparian corridors would be constructed adjacent to surface water receptors, the short-term exposure to site workers would be limited. The site worker exposure risks would be minimized through the use of proper PPE. Because earthwork would be performed adjacent to surface water bodies, it would be necessary to construct silt fences along the riparian corridors.

Implementability

The construction of riparian corridors is technically and administratively feasible along the wetlands adjacent to Sites 11 and 30. The areas to be remediated are readily accessible, and water table is high. Furthermore, these areas have limited site development potential, ensuring that this remedy can be applied as a long-term remedy. The planting of phreatophyte trees, however, may inhibit stormwater drainage from the wetlands. The hydraulic impact of the riparian corridor and the necessity of channel improvements in the wetlands would need to be evaluated in a conceptual design. Channel improvements are not considered in this evaluation.

The riparian corridors alternative would include pilot testing to determine the appropriate species of tree and soil amendments. Because at least eight species of poplar are indigenous to North America and because of their ability to form hybrids, it is expected that poplars can be cultivated in Pensacola. Trees are typically planted at a closely spaced interval in three parallel trenches. Because of the high water table, the trees may not need to be irrigated to become established. The riparian corridor would be closely monitored the first year to assure that the trees become established. In subsequent years, inspections would be performed to monitor the health of the trees and the effectiveness the remedy. The effectiveness of the riparian corridors at satisfying the RAOs must be continually monitored.

Although phytoremediation is a fairly new technology, there are no concerns related to the availability of services and materials.

Cost

Figure 6-4 shows the locations of the proposed riparian corridors. The total length of the riparian corridors is 3,240 feet, and the width is 60 feet. Prior to construction, these 4.5 acres would be cleared and grubbed to remove existing vegetation. The riparian corridors would be constructed by planting 1,674 3-foot whip trees and installing an irrigation system. The whips would be expected to quickly become established when properly fertilized while planting and when irrigated. Ten 2-inch monitoring wells would be constructed to a 15-foot depth to facilitate performance monitoring of the riparian corridors. Soil and groundwater samples would be collected annually and analyzed for VOCs and MNA parameters for 30 years. The riparian corridor would also be inspected annually to assess the health of the trees. The results of the sampling and inspection would be used to complete the annual performance reviews (U.S. Navy, October 2003).

The RACER summary costs for the riparian corridor alternative are given in Appendix C. The cost summary reports include 1) the site cost over time, 2) the phase technology cost detail for construction and operation, 3) the phase cost summary for design, and 4) the phase technology cost detail for long-term groundwater monitoring. The first-year cost of the riparian corridors alternative is $252,100, which includes design, construction, first-year operation, performance sampling, and long-term groundwater sampling and analysis. Performance and long-term groundwater sampling would continue for 30 years. When discounted at 6%, the total present value of the riparian corridors alternative is $1,843,700.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the riparian corridors alternative will be established after the public comment period.

7.2.3 Alternative 3: Permeable Reactive Barrier and Riparian Corridors

The intended purpose of the riparian corridors would be to protect the surface water receptors by treating and removing groundwater contamination and by potentially limiting the infiltration of groundwater into surface water by transpiring the groundwater into the trees. Although riparian corridors would be protective of adjacent surface waters, they would not be applied to meet groundwater CTLs away from the adjacent wetlands. In Alternative 3, PRBs are added as a complementary component of Alternative 2, which treats the chlorinated solvent plume extending from the southeast corner of the Building 649 complex. Thus, Alternative 3 includes all of the components of Alternative 2, plus the construction of a PRB. The locations of the proposed PRB and the riparian corridors are shown in Figure 6-5.

The PRB and riparian corridors alternative includes post-active remediation monitoring, as specified in the no-action alternative in Section 6.2.1. The groundwater data would be analyzed in the 5-year reviews. Because 5-year reviews are considered in the soil RAAs, they are not independently considered in this alternative.

Threshold Criteria

Overall Protective of Human Health and the Environment

Riparian corridors are a relatively new technology and they have mainly been used to remediate water soluble nutrients and pesticides. Poplars have been applied to mineralize atrazine and degrade chlorinated solvents. The effectiveness of this technology might be limited to easily assimilated and metabolized compounds, however.

Phreatophytes are particularly suited for hydraulic control. Because the shallow aquifer has such a high hydraulic conductivity, however, riparian corridors/buffer strips would have limited capability of hydraulically controlling the aquifer – the geometric mean of hydraulic conductivity in shallow OU 2 wells was 167.7 ft/day, as reported in RI.

Riparian corridors are not immediately effective. Although poplars are fast growing trees, they would probably take a year to become established. Thus, the riparian corridors alternative effectiveness increases with time. Many of the trees, however, will not reach maturity due to overcrowding, competition, and disease. Young trees may also be prone to damage by animals. Poplar trees also have a short lifespan of approximately 20 years.

Riparian corridors have a secondary advantage of stabilizing the stream bank and preventing erosion. They also greatly improve the aquatic and terrestrial habitats.

The construction of a ZVI PRB would provide an additional level of effectiveness than riparian corridors do alone. Although riparian corridors are protective of surface waters, they do not address groundwater CTL exceedances away from the adjacent wetlands. Furthermore, riparian corridors require time to reach their maximum effectiveness and the effectiveness is uncertain. In contrast, PRBs are immediately effective at treating passing groundwater. Thus, the construction of a PRB would passively treat the most contaminated groundwater and provide an additional level of protection for surface waters.

Although ZVI PRBs are effective at reducing the concentrations of many of the COPCs, they produce undesirable groundwater quality immediately downgradient of the PRB. The undesirable effects include increased pH, decreased dissolved oxygen, and ferrous iron leaching. Although these effects are generally limited to the groundwater immediately downgradient of the PRB, the aquifer resiliency is highly site-specific. These conditions would not be expected to mobilize contamination, but would be stress the microbes and make the downgradient zone unfavorable for the oxidation and biodegradation of reduced hydrocarbons, such as BTEX compounds. If the riparian corridor is situated downgradient of the PRB, it would amend the adverse effects, if any, before the groundwater is discharged to surface water.

Compliance with ARARs

The PRB and riparian corridors alternative is compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780. Groundwater would be managed under Risk Management Option Level II, 62-780.680(2), FAC, which permits no further action with institutional and engineering controls, where the PRB and the riparian corridors are considered engineering controls. Riparian corridors would provide limited treatment, removal, and containment of groundwater discharging to surface waters, and the effectiveness of the remedy would need to be continually monitoring. The PRB would address contaminated groundwater near the Building 649 complex, and would provide a redundancy for riparian corridors constructed adjacent to Wetland 5A. The combination of these technologies increases the likelihood that groundwater discharging to the adjacent wetlands would not exceed Class III surface water criteria, as established in 62-777, FAC.

The PRB and riparian corridors alternative may invoke action-specific ARARs related to the generation and disposal of hazardous waste contained in soil, and the discharge of stormwater. Action-specific ARARs relating to the generation and disposal of hazardous waste in soil may include the following:

- RCRA Identification of Hazardous Waste (40 CFR §261)
- RCRA Generator Standards (40 CFR §262)
- RCRA Facility Standards (40 CFR §264)
- RCRA Land Disposal Restrictions (40 CFR §268)
- Department of Transportation Rules for the Transport of Hazardous Substances (49 CFR Parts §107 and §171-179)
- Toxic Substance Control Act (40 CFR §761 Subpart D, Storage and Disposal)

Action-specific ARARs relating to the management of stormwater may include the following:

- Clean Water Act NPDES (40 CFR §122, §125, §129, and §136)
- Regulations of Stormwater Discharge (Chapter 62-25, FAC)

Balancing Criteria

Long-Term Effectiveness and Permanence

Riparian corridors may achieve long-term effectiveness and permanence with very little long-term oversight. Mature phreatophyte trees develop a root structure that intersects the groundwater to surface water pathway interface, which facilitates phytoremediaton processes for the treatment, removal, and control of groundwater contamination. Because the degree of treatment is uncertain, the ability of riparian corridors to achieve the RAOs must be continually assessed. Riparian corridors also stabilize stream banks, reduce erosion, and provide terrestrial and aquatic habitats, which is protective of the flora and fauna at the site. The long-term effectiveness of riparian corridors is mitigated by the approximate 20-year lifespan of the poplars.

ZVI PRBs would have limited long-term effectiveness and permanence with very little long-term oversight. ZVI has a limited period of effectiveness due to its oxidation by dissolved oxygen, sulfate, and oxidizing contaminants. The effectiveness of the PRB can also decrease due to a loss of permeability, which results by the hydroxide precipitation of metals in the high pH (perhaps pH of 9) environment of the PRB. Although the PRB would have a limited lifespan due to decreased reactivity and permeability, there is insufficient precedence to determine how long the PRB would remain sufficiently effective and when it should be replaced. The PRB would be expected to be effective for a minimum of 10 to 20 years, however. During this period, many pore volumes of groundwater would pass through the PRB and the remaining contamination would presumably decrease due to attenuation processes.

Reduction of Toxicity, Mobility, or Volume through Treatment

Riparian corridors apply phytoremediation processes to reduce the toxicity, mobility, and volume of groundwater contamination. The incorporate the phytoremediation processes of hydraulic control, phytodegradation, rhizodegradation, phytovolatilization, and perhaps phytoextraction. These processes are described in Section 6.1.4. The degree of treatment, removal, and control is uncertain, and must be continually assessed to determine whether RAOs are satisfied. Riparian corridors meet the statutory preference for treatment.

ZVI PRBs reduce the toxicity of chlorinated solvents and other oxidizing contaminants. Chlorinated solvents and their daughter products are reductively dechlorinated by the ZVI. ZVI PRBs can also immobilize metal contaminants. Several redox reactions produce hydroxide ions, which can raise the pH to more than 9 and promote the precipitation of many metal species. In poorly buffered groundwater, the pH has been reported to increase to 11. Thus, ZVI PRBs also meet the statutory preference for treatment.

Short-Term Effectiveness

Riparian corridors have limited short-term effectiveness. In this alternative, the phytoremediation trees would be planted as closely spaced 3-foot whip trees (one tree per 116 square feet). The growth of the trees would be stimulated by adding specialized soil nutrients and then irrigating them with nutrient amended water. The nutrients may also biostimulate indigenous microbes capable of bioremediate processes. Because of the high water table, the trees may start influencing the groundwater after 1 to 2 years. Young poplars were estimated to transpire 8 gpd, 5-year-old poplars can transpire 25 to 50 gpd, and mature phreatophyte trees can transpire 200 to 400 gpd (EPA/600/R-99/107). Thus, the effectiveness of the riparian corridors alternative increases with time.

Once constructed, ZVI PRBs are immediately effective. Because PRBs are a passive treatment technology, only the groundwater passing through the PRB would be treated. Thus, groundwater upgradient of the PRB in the Building 649 complex would continue to exceed groundwater CTLs. Because groundwater currently has no beneficial use, this should not present a risk.

Because the riparian corridors would be constructed adjacent to surface water receptors, the short-term exposure to site workers would be limited. The soil contamination levels would be anticipated to be higher in the subsurface soil near the proposed PRB. The site worker exposure risks would be minimized through the use of proper PPE. Because earthwork would be performed adjacent to surface water bodies, it would be necessary to construct erosion controls such as silt fences along the riparian corridors. Although the construction of the PRB may result in temporary, increased erosion to Wetland 5A, appropriate measures would be taken to minimize erosion. These measures may include silt fencing and hay bails, temporary and permanent run-on and runoff control, and re-seeding.

Implementability

The construction of riparian corridors is technically and administratively feasible along the wetlands adjacent to Sites 11 and 30. The areas to be remediated are readily accessible, and water table is high. Furthermore, these areas have limited site development potential, ensuring that this remedy can be applied as a long-term remedy. The planting of phreatophyte trees, however, may inhibit stormwater drainage from the wetlands. The hydraulic impact of the riparian corridor and the necessity of channel improvements in the wetlands would need to be evaluated in a conceptual design. Channel improvements are not considered in this evaluation.

The riparian corridors alternative would include pilot testing to determine the appropriate species of tree and soil amendments. Because there are at least eight species of poplar indigenous to North America and because of their ability to form hybrids, it is expected that poplars can be cultivated in Pensacola. Trees are typically planted at a closely spaced interval in three parallel trenches. Because of the high water table, the trees may not need to be irrigated to become established. The riparian corridor would be closely monitored the first year to assure that the trees become established. In subsequent years, inspections would be performed to monitor the health of the trees and the effectiveness the remedy. The effectiveness of the riparian corridors at satisfying the RAOs must be continually monitored.

Although phytoremediation is a fairly new technology, there are no concerns related to the availability of services and materials.

The construction of a PRB is technically and administratively feasible near the Building 649 complex. The preferred location for the PRB is immediately downgradient of the Building 649 complex, along an equal potentiometric line, upgradient of Wetland 5A. This location extends across Murray Road and probably intersects underground utilities. If the PRB is constructed under Murray Road, the road would need to be temporary closed and repaved. The PRB could either be designed around the underground utilities or the utilities could be re-routed. In addition to the construction of an impermeable barrier at the top of the PRB, the ground surface may need to be re-contoured to limit the infiltration of surface water into the PRB.

The PRB could be constructed by a number of methods, including excavation and slurry trenching, deep soil mixing, and high pressure jetting. The construction method would be selected during the design, and would be dependent on the hydraulic and soil properties, the desired reactivity, the redundancy of downgradient protection, the presence and persistence of utilities, and the relative construction cost. PRBs are conventionally constructed in an excavated trench that is filled with bentonite slurry. While the trench is extended, reactive media is added to displace the slurry, such that approximately 300 feet of slurry mixture is reused for an elongated trench. This method may not be feasible, however, because flowing sands may collapse the slurry trench and the presence and persistence of underground utilities may make this method difficult to implement. Although deep soil mixing and high pressure jetting are less invasive methods of emplacement, they emplace less reactive media and do not ensure continuity of the PRB.

There are several vendors capable of constructing a PRB by the slurry trenching method or the deep soil mixing method. Although there are a limited number of vendors who provide high pressure jetting, this does not preclude its application.

Once constructed, PRBs require minimal maintenance. The maintenance requirements would be limited to effectiveness monitoring, which may be used to evaluate the longevity of the PRB.

Cost

Figure 6-5 shows the locations of the proposed PRB and riparian corridors. The total length of the riparian corridors is 3,240 feet, and the width is 60 feet. Prior to construction, these 4.5 acres would be cleared and grubbed to remove existing vegetation. The riparian corridors would be constructed by planting 1,674 3-foot whip trees and installing an irrigation system. The whips would be expected to quickly become established when properly fertilized while planting and when irrigated. Ten 2-inch monitoring wells would be constructed to a 15-foot depth to facilitate performance monitoring of the riparian corridors. Soil and groundwater samples would be collected annually and analyzed for VOCs and MNA parameters for 30 years. The riparian corridor would also be inspected annually to assess the health of the trees. The results of the sampling and inspection would be used to complete the annual performance reviews (U.S. Navy, October 2003).

In this cost estimate, the PRB would be constructed using a conventional method of excavating a trench, securing it with a bentonite slurry, and displacing the slurry with reactive media. The PRB would be 720 feet long, 40 feet deep, and 2.5 feet wide. The lower 30 feet of the PRB would be constructed of 50% iron fillings and 50% pea gravel and the top 10 feet of the PRB would be constructed of montmorillonite clay. Fifteen 2-inch monitoring wells would be constructed to a 40-foot depth on the downgradient side of the PRB to facilitate performance monitoring.

Groundwater samples would be collected annually and analyzed for VOCs. The analytical results would be used to complete the annual performance review (U.S. Navy, October 2003).

The RACER summary costs for the PRB and riparian corridor alternative are given in Appendix C. The cost summary reports include 1) the site cost over time, 2) the phase technology cost detail for construction and operation, 3) the phase cost summary for design, and 4) the phase technology cost detail for long-term groundwater monitoring. The first-year cost of the PRB and riparian corridors alternative is $2,619,300, which includes design, construction, first-year operation, performance sampling, and long-term groundwater sampling. Performance and long-term groundwater sampling would continue for 30 years. When discounted at 6%, the total present value of the PRB and riparian corridors alternative is $4,694,500.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the PRB and riparian corridors alternative will be established after the public comment period.

7.2.4 Alternative 4: Groundwater Pumping and Discharge to FOTW

Groundwater pumping is a conventional method for remediating groundwater and includes the processes of containment, removal, and treatment. Extraction wells are installed near contaminant hotspots to remove groundwater contamination. Pumping also has the capability of hydraulically containing groundwater contamination, which may prevent the seepage of contaminated groundwater into adjacent surface waters. Extracted groundwater is then treated and disposed.

The high permeability of the surficial sand and gravel aquifer may make the groundwater pumping alternative impracticable. In the RI, the geometric mean of the hydraulic conductivity was 167.7 ft/day for the shallow aquifer. When the hydraulic conductivity is large, the well yield is large and the radius of influence is limited. In the surficial sand and gravel aquifer, the well yield is pump-constrained, as opposed to formation-constrained. As discussed in Section 6.2.4, a 70.2 gpm pumping rate is needed to induce a 2-foot drawdown in the aquifer adjacent to the extraction well. Figure 6-6 shows the estimated radius of influence when 70 gpm is continuously pumped from a 6-inch extraction well after 7 days, and shows a 0.34-foot drawdown 87 feet from the extraction well. In the conceptual evaluation of the groundwater pumping alternatives, groundwater contamination is addressed by pumping groundwater at a 70-gpm pumping rate from multiple 6-inch extraction wells, which are presumed to have 100-foot radii of influence.

The extraction well network would consist of 13 extraction wells, constructed to 25 feet bgl, on the downgradient perimeter of OU 2 to address groundwater discharging to surface water, and three extraction wells, constructed to 25 feet bgl, to treat the VOC source area in the Building 649 complex. Extraction wells would be spaced at an approximate 200-foot interval, which is estimated to hydraulically contain groundwater. The extraction well locations are shown in Figure 6-7, which are superimposed on the Phase III VOC GCTL exceedances, shown in Figure 4-19. As shown in Figure 4-16, there were limited Phase III SVOC GCTL exceedances, and these occurred in wells with VOC exceedances. Because monitoring wells 30GS111 and 30GI111 occur on the opposite side of Wetland 6, SVOC and VOC exceedances in these monitoring wells are not addressed in this remedy. The extraction well network would address the GCTL exceedances for barium, cadmium, chromium, and lead, which are shown in Figure 4-9, with the exception of marginal lead exceedance in monitoring well 30GS126, which is adjacent to Wetland 5B. The extraction well network would not address exceedances of secondary drinking water standards for inorganics, specifically aluminum, iron, and manganese, which are shown in Figure 4-8. Secondary drinking water standard exceedances are presumed to be attributed to natural background conditions.

Alternatives 4 and 5 differ only in the groundwater disposal option. In Alternative 4, groundwater is discharged directly to the FOTW, whereas in Alternative 5, groundwater is treated and discharged to the adjacent wetlands. Although Alternative 4 is favorable, the quality and quantity of extracted groundwater may exceed the FOTW's pretreatment standards or capacity. In other NAS Pensacola remediaton activities, the FOTW has both accepted and rejected extracted wastewater for treatment. If a significant percentage of brackish groundwater is extracted, the salinity of the water may be detrimental to the activated sludge at the FOTW. In Alternative 4, extracted groundwater would be routed through multiple trunk lines, and discharged to the FOTW through the sanitary sewer system.

The groundwater pumping alternatives include post-active remediation monitoring, as specified in the no-action alternative in Section 6.2.1.

Threshold Criteria

Overall Protective of Human Health and the Environment

The groundwater pumping alternatives are effective for the containment, removal, and treatment of contamination groundwater. The 13 extraction wells proposed along the wetlands would prevent contaminated groundwater from discharging to the wetlands, and are thus protective of Class III surface waters. The three extraction wells proposed in the Building 649 complex would be used to remove the source area contamination, and would thus be protective of the future beneficial use of groundwater. If concentrations of contaminants are reduced to below GCTLs, groundwater pumping may be stopped. In many pump-and-treat systems, however, the satisfaction of the RAOs may be elusive and the pump-and-treat remedy may turn into a long-term remedy.

Compliance with ARARs

The groundwater pumping and FOTW discharge alternative is compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780. Groundwater would be managed under Risk Management Option Level II, 62-780.680(2), FAC, which permits no further action with institutional and engineering controls, where the groundwater pumping, treatment, and discharge system is used as an engineering control. Groundwater pumping would provide containment, removal, and treatment of groundwater discharging to surface water at concentrations exceeding Class III surface water CTLs and GCTLs based on ingestion (lifetime excess cancer risk of 1E-06), as established in 62-777, FAC.

The groundwater pumping and FOTW discharge alternative may invoke action-specific ARARs related to the generation and disposal of hazardous waste in soil, and the treatment and disposal of groundwater. Action-specific ARARs relating to the generation and disposal of hazardous waste in drill cuttings may include the following:

- RCRA Identification of Hazardous Waste (40 CFR §261)
- RCRA Generator Standards (40 CFR §262)
- RCRA Facility Standards (40 CFR §264)
- RCRA Land Disposal Restrictions (40 CFR §268)
- Department of Transportation Rules for the Transport of Hazardous Substances (49 CFR Parts §107 and §171-179)
- Toxic Substance Control Act (40 CFR §761 Subpart D, Storage and Disposal)

Action-specific ARARs relating to the treatment and disposal of contaminated groundwater through the FOTW may include the following:

- Clean Water Act General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR §403)

Balancing Criteria

Long-Term Effectiveness and Permanence

Although groundwater pumping removes contaminant mass from the groundwater, it may be difficult to reduce contaminant concentrations to below GCTLs. Additionally, contaminant concentrations may rebound when pumping is stopped. Contaminant rebound occurs when contaminants leach from lower permeability soils into the more productive intervals. Thus, contaminant rebound is more significant in heterogeneous aquifers. Because of difficulties in sufficiently removing contaminant mass, pump-and-treat remedies often turn into long-term remedies where hydraulic control is emphasized.

Reduction of Toxicity, Mobility, or Volume through Treatment

Groundwater pumping removes contaminant mass from the groundwater. In Alternative 4, the extracted groundwater is routed to the FOTW for treatment and disposal. Groundwater pumping would also be used to hydraulically contain groundwater contamination and prevent it from entering surface waters. Thus, groundwater pumping immobilizes groundwater contamination during the active pumping phase of a pump-and-treat remedy.

Short-Term Effectiveness

Groundwater pumping has short-term effectiveness for the hydraulic control of groundwater contamination. As pumping continues, an increasing mass of contamination is removed from the aquifer.

The construction of the 16 extraction wells would generate potentially contaminated drill cuttings and the subsurface conveyances may be constructed through contaminated surface soils. Although construction may pose a short-term risk to site workers, the risk would be minimized through the use of proper PPE.

Implementability

The construction of the extraction well network and piping for FOTW discharge to the sanitary sewer is technically feasible at OU 2. However, it is not known whether the extracted groundwater would exceed the quality and quantity restrictions for FOTW disposal. In the conceptual groundwater pumping scenario, 16 extraction wells would be constructed and continuously pumped at 70 gpm, which produces at total continuous discharge of 1,120 gpm. This discharge quantity may exceed the treatment capacity of the FOTW. Additionally, four of the extraction wells are constructed within 150 feet of the tidally influenced Yacht Basin, and these wells may produce brackish water, which may be prohibited from the FOTW discharge. Other than the pretreatment standards and capacity constraints of the FOTW, no additional concerns are related to the availability of services and materials.

As discussed in Section 6.2.4, the Navy is predisposed against the installation of new pump-and-treat systems, and an additional level of scrutiny is required. Groundwater pumping may turn into a *de facto* long-term remedy if remedial goals are not met.

Cost

Figure 6-7 shows the locations of the 16 proposed extraction wells. The extraction wells are 6-inch PVC wells constructed to a depth of 25 feet. Groundwater is pumped from the wells into subsurface conveyance piping. The conveyance piping from the 16 extractions well to the sanitary sewer is estimated to include 3,000 feet of force main piping. Because 13 of the extraction wells are located at topographic lows along the wetlands waterfront, this estimate includes two prefabricated 800,000-gpd lift stations. The cost estimates include O&M for 30 years. O&M activities include maintenance of the 16 groundwater pumps and two lift stations and the collection of monthly compliance samples for FOTW discharge.

The RACER summary costs for the groundwater pumping and FOTW discharge alternative are given in Appendix C. The cost summary reports include 1) the site cost over time, 2) the phase technology cost detail for construction, 3) the phase cost summary for design, 4) the phase technology cost detail for O&M, and 5) the phase technology cost detail for long-term groundwater monitoring. The first-year cost of the groundwater pumping and FOTW discharge alternative is $922,800, which includes design, construction, O&M, compliance sampling, and long-term groundwater sampling. O&M, compliance sampling, and long-term groundwater sampling would continue for 30 years. When discounted at 6%, the total present value of the groundwater pumping and FOTW discharge alternative is $3,228,900.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the groundwater pumping and FOTW discharge alternative will be established after the public comment period.

7.2.5 Alternative 5: Groundwater Pumping, Treatment, and Discharge to Wetlands

Groundwater pumping is a conventional method for remediating groundwater and includes the processes of containment, removal, and treatment. Extraction wells are installed near contaminant hotspots to remove groundwater contamination. Pumping also has the capability of hydraulically containing groundwater contamination, which may prevent the seepage of contaminated groundwater into adjacent surface waters. Extracted groundwater is then treated and disposed.

The high permeability of the surficial sand and gravel aquifer may make the groundwater pumping alternative impracticable. In the RI, the geometric mean of the hydraulic conductivity was 167.7 ft/day for the shallow aquifer. When the hydraulic conductivity is large, the well yield is large and the radius of influence is limited. In the surficial sand and gravel aquifer, the well yield is pump constrained, as opposed to formation constrained. As discussed in Section 6.2.4, a 70.2-gpm pumping rate is needed to induce a 2-foot drawdown in the aquifer adjacent to the extraction well. Figure 6-6 shows the estimated radius of influence when 70 gpm is continuously pumped from a 6-inch extraction well after 7 days and shows a 0.34-foot drawdown 87 feet from the extraction well. In the conceptual evaluation of the groundwater pumping alternatives, groundwater contamination is addressed by pumping groundwater at a 70-gpm pump rate from multiple 6-inch extraction wells, which are presumed to have 100-foot radii of influence.

The extraction well network would consist of 13 extraction wells, constructed to 25 feet bgl, on the downgradient perimeter of OU 2 to address groundwater discharging to surface water and three extraction wells, constructed to 25 feet bgl, to treat the VOC source area in the Building 649 complex. Extraction wells would be spaced at an approximate 200-foot interval, which is estimated to hydraulically contain groundwater. The extraction well locations are shown in Figure 6-7, which are superimposed on the Phase III VOC GCTL exceedances, shown in Figure 4-19. As shown in Figure 4-16, there were limited Phase III SVOC GCTL exceedances, and these occurred in wells with VOC exceedances. Because monitoring wells 30GS111 and 30GI111 occur on the opposite side of Wetland 6, SVOC and VOC exceedances in these monitoring wells are not addressed in this remedy. The extraction well network would address the GCTL exceedances for barium, cadmium, chromium, and lead, which are shown in Figure 4-9 with the exception of marginal lead exceedance in monitoring well 30GS126, which is adjacent to Wetland 5B. The extraction well network would not address exceedances of secondary drinking water standards for inorganics, specifically aluminum, iron, and manganese, which are shown in Figure 4-8. Secondary drinking water standard exceedances are presumed to be attributed to natural background conditions.

Alternatives 4 and 5 differ only in the groundwater disposal option. In Alternative 4, groundwater is discharged directly to the FOTW, whereas in Alternative 5, groundwater is treated and discharged to the adjacent wetlands. Although Alternative 4 is favorable, the quality and quantity of extracted groundwater may exceed the FOTW's pretreatment standards or capacity. In other NAS Pensacola remediaton activities, the FOTW has both accepted and rejected extracted wastewater for treatment. If a sufficient percentage of brackish groundwater is extracted, the salinity of the water may be detrimental to the activated sludge at the FOTW.

In Alternative 5, extracted groundwater would be routed through multiple trunk lines to a treatment system and then discharged to the wetlands as an NPDES permitted discharge. Extracted groundwater would be primarily contaminated with VOCs but may also need treatment for

SVOC and metal exceedances. The treatment scenario developed in this alternative includes air stripping as primary treatment and GAC as secondary treatment. Air stripping is a conventional method for removing chlorinated solvents and BTEX from extracted groundwater. Air stripping may also have limited effectiveness for SVOC and metals treatment, possibly through scaling processes. GAC would be required as secondary treatment, however, to remove residual SVOCs, VOCs, and metals from the waste stream. After primary treatment, extracted groundwater would be routed through sequential GAC canisters, and the water quality would be measured from a sample port in between the GAC canisters. This sample location guarantees that contaminant breakthrough could be observed and that appropriate measures such as GAC replacement can be performed. GAC replenishment and disposal would be performed offsite. After primary and secondary treatment, the treated groundwater would be discharged to the adjacent wetlands as a NPDES-permitted discharge. As discussed in Section 6.2.5, the vapor discharge of the air stripper would be expected to be exempted from permitting.

The groundwater pumping alternatives include post-active remediation monitoring, as specified in the no-action alternative in Section 6.2.1.

Threshold Criteria

Overall Protective of Human Health and the Environment

The groundwater pumping alternatives are effective for the containment, removal, and treatment of contamination groundwater. The 13 extraction wells proposed along the wetlands would prevent contaminated groundwater from discharging to the wetlands and are thus protective of Class III surface waters. The three extraction wells proposed in the Building 649 complex would be used to remove the source area contamination and would thus be protective of the future beneficial use of groundwater. If concentrations of contaminants are reduced to below GCTLs, groundwater pumping may be stopped. In many pump-and-treat systems, however, the satisfaction of the RAOs may be elusive, and the pump-and-treat remedy may turn into a long-term remedy.

Discharging the extracted groundwater to the wetlands would help maintain the existing water balance. As considered, approximately 1,120 gpm of groundwater would be extracted from the shallow sand and gravel aquifer. Most of this groundwater would normally discharge to the wetlands, and the pumping in extraction wells adjacent to the wetlands may actually drain Wetlands 5A and 5B. Thus, by discharging treated groundwater to the wetlands, the continued water balance of the wetlands would be maintained, which would protect the existing flora and fauna in the adjacent Wetlands 5A and 5B.

Compliance with ARARs

The groundwater pumping, treatment, and NPDES discharge alternative is compliant with the contaminant site cleanup criteria established in Proposed Rule 62-780. Groundwater would be managed under Risk Management Option Level II, 62-780.680(2), FAC, which permits no further action with institutional and engineering controls where the groundwater pumping, treatment, and discharge system is used as an engineering control. Groundwater pumping would provide containment, removal, and treatment of groundwater discharging to surface water at concentrations exceeding Class III surface water CTLs and GCTLs based on ingestion (lifetime excess cancer risk of 1E-06), as established in 62-777, FAC.

The groundwater pumping, treatment, and NPDES discharge alternative may invoke action-specific ARARs related to the generation and disposal of hazardous waste in soil, and the treatment and disposal of groundwater. Action-specific ARARs relating to the generation and disposal of hazardous waste in drill cuttings may include the following:

- RCRA Identification of Hazardous Waste (40 CFR §261)
- RCRA Generator Standards (40 CFR §262)
- RCRA Facility Standards (40 CFR §264)
- RCRA Land Disposal Restrictions (40 CFR §268)

- Department of Transportation Rules for the Transport of Hazardous Substances (49 CFR Parts §107 and §171-179)

- Toxic Substance Control Act (40 CFR §761 Subpart D, Storage and Disposal)

Action-specific ARARs relating to the treatment and disposal of contaminated groundwater may include the following:

- Clean Air Act Permits Regulation (40 CFR §72)
- Stationary Sources — General Requirements (Chapter 62-210, FAC)
- Stationary Sources — Emission Standards (Chapter 62-296, FAC)
- Operation Permits for Major Sources of Air Pollution (Chapter 62-213, FAC)
- Stationary Sources — Preconstruction Review (Chapter 62-212, FAC)
- Permits (62 Chapter 62-4, FAC)
- Clean Water Act NPDES (40 CFR §122, §125, §129, and §136)

Balancing Criteria

Long-Term Effectiveness and Permanence

Although groundwater pumping removes contaminant mass from the groundwater, it may be difficult to reduce contaminant concentrations to below GCTLs. Additionally, contaminant concentrations may rebound when pumping is stopped. Contaminant rebound occurs when contaminants leach from lower permeability soils into the more productive intervals. Thus, contaminant rebound is more significant in heterogeneous aquifers. Because of difficulties in sufficiently removing contaminant mass, pump-and-treat remedies often turn into long-term remedies where hydraulic control is emphasized.

Reduction of Toxicity, Mobility, or Volume through Treatment

Groundwater pumping removes contaminant mass from the groundwater. In Alternative 5, the extracted groundwater is routed to groundwater treatment system, before discharge to the wetlands. Air stripping would be primarily used to remove VOCs and would have limited effectiveness for SVOC and metals removal. GAC would be used as secondary treatment to remove residual SVOCs and metals, prior to discharge. Groundwater pumping would also be used to hydraulically contain groundwater contamination and prevent it from entering surface waters. Thus, groundwater pumping immobilizes groundwater contamination during the active pumping phase of a pump-and-treat remedy.

Short-Term Effectiveness

Groundwater pumping has short-term effectiveness for the hydraulic control of groundwater contamination. As pumping continues, an increasing mass of contamination is removed from the aquifer.

The construction of the 16 extraction wells would generate potentially contaminated drill cuttings, and the subsurface conveyances may be constructed through contaminated surface soils. Although construction may pose a short-term risk to site workers, the risk would be minimized through the use of proper PPE.

Implementability

The groundwater pumping, treatment, and discharge to wetlands alternative is technically feasible at OU 2. The operation of the groundwater pumps, the air strippers, and the GAC canisters can be automated and telemetry installed to facilitate minimal O&M. Although this treatment system could be designed for minimal O&M, air strippers are prone to scaling from iron oxidation. Sequestering agents may be used to minimize scaling. Monthly O&M may be required to inspect the treatment system, replenish the sequestering agent, acid-wash the air stripper, and replace the GAC canister, as needed. Monthly maintenance may also be required to collect compliance samples for the discharge monitoring reports, as specified in the NPDES permit.

As discussed in Section 6.2.4, the Navy is predisposed against the installation of new pump-and-treat systems, and an additional level of scrutiny is required. Groundwater pumping may turn into a *de facto* long-term remedy if remedial goals are not met.

Cost

Figure 6-7 shows the locations of the 16 proposed extraction wells. The extraction wells are 6-inch PVC wells constructed to a depth of 25 feet. Groundwater is pumped from the wells into subsurface conveyance piping. The conveyance piping from the 16 extractions well to the sanitary sewer is estimated to include 3,000 feet of pressure-rated piping. Because 13 of the extraction wells are located at topographic lows along the wetlands waterfront, this estimate includes two prefabricated 800,000-gpd lift stations. Alternative 5 also includes air stripping and GAC treatment systems for the 1,120-gpm flow. The component details for the treatment system are provided in the RACER cost estimates in Appendix C. The cost estimates include O&M for 30 years. O&M activities include maintenance of the 16 groundwater pumps and two lift stations, maintenance of the air stripping and GAC treatment systems, and the collection of monthly compliance samples for NPDES discharge and vapor discharge from the air stripper.

The RACER summary costs for the groundwater pumping, treatment, and NPDES discharge alternative are given in Appendix C. The cost summary reports include 1) the site cost over time, 2) the phase technology cost detail for construction, 3) the phase cost summary for design, 4) the phase technology cost detail for O&M, and 5) the phase technology cost detail for long-term groundwater monitoring. The first-year cost of the groundwater pumping, treatment, and NPDES discharge alternative is $1,569,800, which includes design, construction, O&M, compliance sampling, and long-term groundwater sampling. O&M, compliance sampling, and long-term groundwater sampling would continue for 30 years. When discounted at 6%, the total present value of the groundwater pumping, treatment, and NPDES discharge alternative is $11,918,300.

Modifying Criteria

Support Agency Acceptance

The Navy has involved FDEP and USEPA throughout the entire remedial process. FDEP will have the opportunity to review and comment on this FS.

Community Acceptance

The status of community acceptance for the groundwater pumping, treatment, and NPDES discharge alternative will be established after the public comment period.

8.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

A comparative analysis of the media-specific RAAs is made by comparing the RAAs on the basis of the nine criteria stipulated in the NCP (40 CFR §300.430) and OSWER Directive 9355.3-01. The comparative analyses for the soil RAAs are given in Table 8-1, and the comparative analyses of the groundwater RAAs are given in Table 8-2. These tables comparatively show the advantages and disadvantages of each RAA.

Table 8-1
Comparative Analysis of Remedial Action Alternatives for Soil Contamination at Operable Unit 2

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Soil and Asphalt Capping	Alternative 4 Phytoremediation Covers and Asphalt Capping	Alternative 5 Excavation and Offsite Disposal
Threshold Criteria					
Overall Protection of Human Health & the Environment	No protection. Numerous residential direct exposure and groundwater-based leachability CTLs would remain.	Protects site workers by facilitating contaminant notification and provides protection to potential future residents. Numerous C/I direct exposure and groundwater-based leachability CTLs would remain.	Surface capping reduces risk of exposure, thus eliminating direct exposure pathway. When constructed as low permeability covers, reduces infiltration, which permits higher leachability-based SCTLs to be calculated. Asphalt caps benefit the industrial usage of the site, and would be constructed in current locations used for light and heavy vehicle parking/storage.		Soils that exceed C/I direct exposure and leachability-based SCTLs would be excavated and disposed offsite.
			N/A	For phytoremediation covers, contaminants may be treated by rhizodegradation and phytotransformation processes, removed by phytoextraction, or controlled by phytostabilization and hydraulic control. The treatment and removal mechanisms may be sufficient to reduce contamination to below C/I direct exposure and leachability-based SCTLs. Hydraulic control holds the moisture in place so that evapotranspiration processes limit the infiltration. When reduced infiltration rates are verified, it may be appropriate to calculate higher, remedy-specific leachability-based SCTLs.	

<table>
<tr><th colspan="6">Table 8-1
Comparative Analysis of Remedial Action Alternatives for Soil Contamination at Operable Unit 2</th></tr>
<tr><th>Evaluation Criteria</th><th>Alternative 1
No Action</th><th>Alternative 2
Institutional Controls</th><th>Alternative 3
Soil and Asphalt Capping</th><th>Alternative 4
Phytoremediation Covers and Asphalt Capping</th><th>Alternative 5
Excavation and Offsite Disposal</th></tr>
<tr><td>Compliance with ARARs</td><td>Not compliant with Proposed Rule 62-780.</td><td>Not compliant with Proposed Rule 62-780.</td><td colspan="2">Compliant with Proposed Rule 62-780. Invokes action-specific ARARs related to cap construction, stormwater discharge, and occupational exposures.</td><td>Compliant with Proposed Rule 62-780. Invokes action-specific ARARs related to hazardous waste generation, transport, and disposal; stormwater discharge; and occupational exposures.</td></tr>
<tr><th colspan="6">Balancing Criteria</th></tr>
<tr><td>Long-Term Effectiveness and Permanence</td><td>Provides no long-term protection from occupational exposure or potential future residential exposure and does not limit contaminant leaching to groundwater.</td><td rowspan="2">Restricts site use and access to industrial usage, but provides no long-term protection from occupational exposure and does not limit contaminant leaching to groundwater.</td><td colspan="2">Long-term effectiveness and permanence depends on site use and structural durability of the caps. Although asphalt caps are prone to damage by inappropriate usage, geotechnical stability, weathering, and vegetative perturbation, these can be minimized through proper design and construction.</td><td rowspan="2">Excavation and offsite disposal has long-term effectiveness and permanence as a remediation technology because contamination is removed from the site. Excavation may be less effective than a capping alternative, however, because all contamination may not be removed using surgical excavation, which is biased towards sampled locations.</td></tr>
<tr><td></td><td></td><td>Although soil caps are prone to damage by erosion, geo-technical stability, and vegetative perturbation, these can be minimized through proper design and construction.</td><td>Phytoremediation covers are a treatment remedy and may reduce contamination levels to below SCTLs. The permanence of low permeability soils reduces the infiltration and leaching of contaminants. The permanence of the phytoremediation treatment and removal processes is dependent on the adaptability and permanence of the phytoremediation vegetation.</td></tr>
</table>

Table 8-1
Comparative Analysis of Remedial Action Alternatives for Soil Contamination at Operable Unit 2

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Soil and Asphalt Capping	Alternative 4 Phytoremediation Covers and Asphalt Capping	Alternative 5 Excavation and Offsite Disposal
Reduction of Toxicity, Mobility, or Volume through Treatment	Limited to natural attenuation processes.	Limited to natural attenuation processes.	Surface capping is a control technology that does not reduce the volume or toxicity of waste. Surface capping provides reliable protection against the direct exposure to contaminated soils. When constructed as low permeability covers, they also reduce infiltration, which permits higher leachability-based CTLs to be calculated.		Although excavation and offsite disposal removes the soil contamination, it does not incorporate treatment processes. Because LDRs are not anticipated to be exceeded, ex situ soil treatment is not necessary prior to land disposal.
			N/A	Phytoremediation covers may reduce the toxicity, mobility, and volume of soil contamination, and may incorporate the processes of hydraulic control, phytodegradation, rhizodegradation, phytovolatilization, and perhaps phytoextraction. The degree of treatment, removal, and control is uncertain.	
Short-Term Effectiveness	Provides no short-term protection from occupational exposure and does not limit contaminant leaching to groundwater.	Restricts site use and access to industrial usage, but provides no short-term protection from occupational exposure and does not limit contaminant leaching to groundwater.	Asphalt caps have immediate effectiveness at reducing direct exposure and infiltration.		Excavation and offsite disposal are immediately protective of human health and the environment because contaminated soils are removed from the site. Excavation may be less effective than a capping alternative, however, because all contamination may not be removed using surgical excavation, which is biased towards sampled locations.
			Soil caps have immediate effectiveness at reducing direct exposure and infiltration.	When constructed with lower permeability soils, phytoremediation covers have short-term effectiveness at reducing contaminant leaching. The irrigation and application of nutrients may biostimulate indigenous microbes, which are capable of bioremediation. The phytoremediation processes become more effective as the phytoremediation vegetation becomes more established.	

<table>
<tr><th colspan="6">Table 8-1
Comparative Analysis of Remedial Action Alternatives for Soil Contamination at Operable Unit 2</th></tr>
<tr><th>Evaluation Criteria</th><th>Alternative 1
No Action</th><th>Alternative 2
Institutional Controls</th><th>Alternative 3
Soil and Asphalt Capping</th><th>Alternative 4
Phytoremediation Covers and Asphalt Capping</th><th>Alternative 5
Excavation and Offsite Disposal</th></tr>
<tr><td>Implementability</td><td>No technical or administrative concerns.</td><td colspan="4">NAS Pensacola currently operates as C/I facility and the base is not proposed for realignment or closure. Thus, land use control agreements may be used to restrict site use. Deed restriction required before property transfer.</td></tr>
<tr><td></td><td></td><td rowspan="2">N/A</td><td colspan="2">The construction of soil, asphalt, and phytoremediation covers is technically feasible at OU 2, and the designated areas are amenable to the specified capping materials. Prior to the full-scale design and concurrent with construction activities, confirmation samples are needed to verify that the contaminated soils are properly addressed. The soil, asphalt, and phytoremediation covers would require periodic inspection. There are no concerns related to the availability of services and materials.</td><td rowspan="2">Excavation and offsite disposal are technically and administratively feasible at OU 2. Excavation is performed frequently and is a reliable method to remove contaminated soil within given boundaries. The excavated soil volume is not anticipated to be sufficient to impose landfill capacity limitations.</td></tr>
<tr><td></td><td></td><td>Soil caps require regular maintenance to minimize cap erosion, and additional construction may be necessary if sufficient erosion of the cap is observed.</td><td>Phytoremediaton covers require regular maintenance to maintain a vegetative presence and possibly to harvest plants designed for phytoextraction. Pilot testing may be necessary to identify best species and nutrient requirements.</td></tr>
<tr><td>Cost</td><td>The 5-year review cost is $16,600, multiplied by the escalation factor, and the present value for 30 years is $53,200.</td><td>The institutional controls cost is $21,900; the 5-year review cost is $16,600, multiplied by the escalation factor; and the present value for 30 years is $75,100.</td><td>First-year cost is $2,654,000, and the present value for 30 years is $3,412,500.</td><td>First-year cost is $2,117,500, and the present value for 30 years is $2,847,700.</td><td>First-year cost is $4,996,300, and the present value for 30 years is $5,049,500.</td></tr>
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Table 8-1
Comparative Analysis of Remedial Action Alternatives for Soil Contamination at Operable Unit 2

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Soil and Asphalt Capping	Alternative 4 Phytoremediation Covers and Asphalt Capping	Alternative 5 Excavation and Offsite Disposal
Modifying Criteria					
Support Agency Acceptance	FDEP and USEPA will have opportunity to review and comment.				
Community Acceptance	Determined after public comment period.				

Notes:

ARAR = applicable or relevant and appropriate requirement
C/I = commercial/industrial
CTL = cleanup target level
FDEP = Florida Department of Environmental Protection
N/A = not applicable
NAS = Naval Air Station
SCTL = soil cleanup target level
USEPA = U.S. Environmental Protection Agency

Table 8-2
Comparative Analysis of Remedial Action Alternatives for Groundwater Contamination at Operable Unit 2

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Riparian Corridors	Alternative 3 PRB and Riparian Corridors	Alternative 4 Groundwater Pumping and Discharge to FOTW	Alternative 5 Groundwater Pumping, Treatment, and Discharge to Wetlands
Threshold Criteria					
Overall Protection of Human Health & the Environment	No protection; Numerous GCTL exceedances would remain and groundwater would continue to leach to surface water at concentrations above Class III surface water criteria.	Riparian corridors have been applied for soluble nutrients, pesticides, and chlorinated solvents, and would have some effectiveness at treating, removing, and controlling groundwater contaminants migrating into adjacent wetlands. Riparian corridors also stabilize stream banks, reduce erosion, and improve terrestrial and aquatic habitats, which are protective of flora and fauna.		Groundwater pumping is effective for the containment, removal, and treatment of contaminated groundwater. The 13 extraction wells proposed along the wetlands would prevent contaminated groundwater from discharging to the wetlands. The three extraction wells proposed in the Building 649 complex would be used to remove source area contamination.	
		N/A	The PRB would passively treat chlorinated solvent plume near Building 649 complex and provide redundant protective of Wetland 5A while the riparian corridor becomes established.	N/A	Discharging treated groundwater to the wetlands would maintain water balance, which is protective of existing flora and fauna in Wetlands 5A and 5B.
Compliance with ARARs	Not compliant with Proposed Rule 62-780.	Compliant with Proposed Rule 62-780. Invokes action-specific ARARs related to stormwater discharge and occupational exposures.		Compliant with Proposed Rule 62-780. Invokes action-specific ARARs related to hazardous waste generation, transport, and disposal and occupational exposures.	
		N/A	PRB may also invoke action-specific ARARs related to hazardous waste generation, transport, and disposal.	Invokes action-specific ARARs related to pre-treatment standards.	Invokes action-specific ARARs related to air permitting and NPDES discharge.
Balancing Criteria					
Long-Term Effectiveness and Permanence	Provides no long-term protection to adjacent wetlands.	Riparian corridors may achieve long-term effectiveness and permanence with little oversight. Effectiveness is uncertain, and permanence is hindered by the approximate 20-year lifespan of the poplar trees.		Although contaminant mass is removed, it may be difficult to reduce contamination to below GCTLs. Contamination may rebound when pumping stops. Pump-and-treat may turn into long-term remedy where hydraulic control is emphasized.	
		N/A	PRBs may have limited long-term effectiveness due to the loss of reactivity and permeability. Insufficient precedence available to assess longevity.		

Table 8-2
Comparative Analysis of Remedial Action Alternatives for Groundwater Contamination at Operable Unit 2

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Riparian Corridors	Alternative 3 PRB and Riparian Corridors	Alternative 4 Groundwater Pumping and Discharge to FOTW	Alternative 5 Groundwater Pumping, Treatment, and Discharge to Wetlands
Reduction of Toxicity, Mobility, or Volume through Treatment	Limited to natural attenuation processes.	Although riparian corridors incorporate phytoremediation processes of hydraulic control, phytodegradation, rhizodegradation, phytovolatilization, and phytoextraction, the degree of treatment, removal, and control is uncertain.		Groundwater pumping removes contaminant mass from the aquifer.	
		N/A	PRB degrades chlorinated solvents and precipitate metals in passing groundwater.	Treatment is accomplished through the FOTW.	Treatment is accomplished through air stripping and GAC processes.
Short-Term Effectiveness	Provides no short-term protection to adjacent wetlands.	Short-term effectiveness at protecting adjacent surface waters is limited for 1 to 2 years while trees become established. Nutrient application incidentally biostimulates microbial population in the interim, which may facilitate contaminant biodegradation.		Groundwater pumping has short-term effectiveness for hydraulic control of groundwater contamination. As pumping continues, an increasing mass of contamination is removed from the aquifer.	
		N/A	PRBs are immediately effective for passing groundwater, which provides redundant protection until the riparian corridor becomes effective.		
Implement-ability	No technical or administrative concerns.	Riparian corridors are technically and administratively feasible and are located in areas that are readily accessible and have limited development potential. Pilot testing may be necessary to identify best species and nutrient requirements. No concerns related to available of services and materials.		The construction of the 16 proposed extraction wells, 3,000 feet of subsurface conveyance pipe, and two lift stations is technically feasible. The Navy is predisposed against the installation of new pump-and-treat systems, and an additional level of scrutiny is required.	
		N/A	PRB is technically and administratively feasible, but issues may arise related to road closure and re-paving, utility locations, storm water management, and construction method. No concerns related to availability of services and materials.	It is not known whether the quality and quantity of groundwater exceeds the pre-treatment standards and capacity of the FOTW.	A large capacity air stripping and GAC treatment system is required for the 1,120-gpm flow, and O&M costs are high.

Table 8-2
Comparative Analysis of Remedial Action Alternatives for Groundwater Contamination at Operable Unit 2

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Riparian Corridors	Alternative 3 PRB and Riparian Corridors	Alternative 4 Groundwater Pumping and Discharge to FOTW	Alternative 5 Groundwater Pumping, Treatment, and Discharge to Wetlands
Cost	Annual cost is $55,200, multiplied by the escalation factor, and the present value for 30 years is $983,800.	First-year cost is $252,100, and the present value for 30 years is $1,843,700.	First-year cost is $2,619,300, and the present value for 30 years is $4,694,500.	First-year cost is $922,800, and the present value for 30 years is $3,228,900.	First-year cost is $1,569,800, and the present value for 30 years is $11,918,300.
Modifying Criteria					
Support Agency Acceptance	FDEP and USEPA will have opportunity to review and comment.				
Community Acceptance	Determined after public comment period.				

Notes:

ARAR	=	applicable or relevant and appropriate requirement
FDEP	=	Florida Department of Environmental Protection
FOTW	=	federally owned treatment works
GAC	=	granular activated carbon
GCTL	=	groundwater cleanup target levels
N/A	=	not applicable
NPDES	=	National Pollutant Discharge Elimination System
PRB	=	permeable reactive barrier
USEPA	=	U.S. Environmental Protection Agency

9.0 REFERENCES

ABB Environmental Services, Inc. (1991). *Site Inspection Report, Cold Storage Facility, Naval Air Station, Pensacola, Florida.* ABB Environmental Services, Inc., Tallahassee, FL.

ABB Environmental Services, Inc. (1993). *Contaminant Assessment Report, Site 3450S, Naval Aviation Depot, Naval Air Station, Pensacola, Florida.* ABB Environmental Services, Inc., Tallahassee, FL.

Bouwer, H. (1978). *Groundwater Hydrology*. New York: McGraw-Hill.

Ecology & Environment, Inc. (E&E). (1990). *Groundwater Flowrate and Direction Determination Report for the Industrial Wastewater Treatment Plant, Naval Air Station, Pensacola, Florida.* Ecology & Environment, Inc., Pensacola, FL.

E&E. (1991a). *Interim Data Report, Contamination Assessment/Remediation Activities Investigation North Chavelier Disposal Area (Site 11), Naval Air Station, Pensacola, Florida,* Ecology & Environment, Inc., Pensacola, FL.

E&E. (1991b). *Interim Data Report, Contamination Assessment/Remediation Activities Investigation Scrap Bins (Site 12), Naval Air Station, Pensacola, Florida,* Ecology & Environment, Inc., Pensacola, FL.

E&E. (1991c). *Interim Data Report, Contamination Assessment/Remediation Activities Investigation Supply Department Outside Storage Area (Site 26), Naval Air Station, Pensacola, Florida,* Ecology & Environment, Inc., Pensacola, FL.

E&E. (1992a). *Interim Data Report, Contamination Assessment/Remediation Activities Investigation — Radium Spill Area (Site 25), Naval Air Station, Pensacola, Florida,* Ecology & Environment, Inc., Pensacola, FL.

E&E. (1992b). *Interim Data Report, Contamination Assessment/Remediation Activities Investigation — Radium Dial Shop (Site 27), Naval Air Station, Pensacola, Florida,* Ecology & Environment, Inc., Pensacola, FL.

E&E. (1992c). *Contamination Assessment/Remediation Activities Investigation, Naval Air Station, Pensacola, Florida. Data Summary and Preliminary Scoping Report for Ecological Risk Assessment Work Plans , Naval Air Station, Pensacola, Florida,* Ecology & Environment, Inc., Pensacola, FL.

EnSafe Inc. (1997). *Remedial Investigation Report OU 2, Naval Air Station, Pensacola, Florida*. EnSafe Inc., Memphis, TN.

EnSafe Inc. (*in press*). *Remedial Investigation Report Site 41, Naval Air Station, Pensacola, Florida*. EnSafe Inc., Memphis, TN.

EnSafe Inc. (2004). *Remedial Investigation Report Addendum OU 2, Naval Air Station, Pensacola, Florida*. EnSafe Inc., Memphis, TN.

EnSafe/Allen & Hoshall, Inc. (1996). *Final Remedial Investigation Report — Site 1, Naval Air Station, Pensacola, Florida*. EnSafe Inc., Memphis, TN.

Florida Department of Environmental Protection (FDEP). (1999, May 26). *Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C.,* FDEP Division of Waste Management, Tallahassee, FL.

Gavaskar, A., Gupta, Sass, B., Janosy, R., & Hicks, J. (2000). *Design Guidance for Application of Permeable Reactive Barriers for Groundwater Remediation*, Battelle, Columbus, Ohio, Funded by U.S. Air Force Research Laboratory, Tyndall AFB, FL.

Geraghty & Miller, Inc. (1984). *Verification Study, Assessment of Potential Groundwater Pollution at Naval Air Station, Pensacola, Florida.* Geraghty & Miller, Inc., Tampa, FL.

Geraghty & Miller, Inc. (1986). *Characterization Study, Assessment of Potential Groundwater Pollution at Naval Air Station, Pensacola, Florida.* Geraghty & Miller, Inc., Tampa, Florida.

Graham, F. (1993). Personal communication with Stephen Howard, EnSafe/Allen & Hoshall, Inc.

Naval Environmental and Engineering Support Activity. (1983). *Initial Assessment Study of Naval Air Station Pensacola, Pensacola, Florida.* (NEESA 13-015).

U.S. Environmental Protection Agency (USEPA). (1986, December 24). *Superfund Selection of Remedy*, *Interim Final*, USEPA Office of Solid Waste and Emergency Response, OSWER Directive 9355.9-19.

USEPA. (1988, October). *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final*, EPA/540/G-89/004. USEPA Office of Solid Waste and Emergency Response, OSWER Directive 9355.3-01.

USEPA. (1992). *Field Investigation, Naval Air Station, Pensacola, Florida.* USEPA Region IV, Athens, Georgia.

USEPA. (1996, May). *Soil Screening Guidance: Technical Background Document,* EPA/540/R-95/128. USEPA Office of Solid Waste and Emergency Response, Washington, DC.

USEPA. (2000, February). *Introduction to Phytoremediation,* EPA/600/R-99/107. USEPA National Risk Management Research Laboratory, Cincinnati, OH.

USEPA. (2001, June). *Comprehensive Five-Year Review Guidance,* EPA/540/R-01/007. USEPA Office of Emergency and Remedial Response, OSWER Directive 9355.7-03B-P.

U.S. Navy. (2003, October). *Navy/Marine Corps Policy for Optimizing Remedial and Removal Actions At All Installation Restoration and Munitions Response Program Sites*, Chief of Naval Operations, 540 N453D/01.

Van Deuren, J., Lloyd, T., Chhetry, S., Liou, R., & Peck, J. (2002). *Remediation Technologies Screening Matrix and Reference Guide, 4th Edition*. Platinum International, Inc., Funded by U.S. Army Environmental Center. Retrieved online at www.frtr.gov/matrix2/section3/matrix.html.

10.0 FLORIDA PROFESSIONAL GEOLOGIST'S SEAL

I have read and approve of this feasibility study for NAS Pensacola Operable Unit 2 and seal it in accordance with Chapter 492 of the Florida statutes. In sealing this document, I certify the geological information contained in it is true to the best of my knowledge and the geological methods and procedures included herein are consistent with currently accepted geological practices.

Name:	Craig Smith
License Number:	1089
State:	Florida
Expiration Date:	July 31, 2006

Craig Smith

Date

11.0 FLORIDA PROFESSIONAL ENGINEER'S SEAL

I am registered to practice engineering by the Florida State Board of Professional Examiners (License No. 50413). I certify, under penalty of law, that the FS for Naval Air Station Pensacola Operable Unit 2 was performed in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. To the best of my knowledge and belief, the information submitted is true, accurate, and complete; and the contents of this document are consistent with currently accepted engineering practices. I am aware of the significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:	Elizabeth Claire Barnett
License Number:	50413
State:	Florida
Expiration Date:	February 28, 2005

____
Elizabeth Claire Barnett

____
Date

Appendix A

Applicable or Relevant and Appropriate Requirements

Table 1
Summary of Potential Chemical-Specific ARARs
NAS Pensacola OU 2 — Sites 11, 12, 25, 26, 27, 30

Requirements	Status	Requirement Synopsis	Application to the RI/FS
Federal Requirements			
Safe Drinking Water Act MCLs 40 CFR §141.11-16	Relevant and Appropriate	MCLs have been set for toxic compounds as enforceable standards for public drinking water systems. SMCLs are unenforceable goals regulating the aesthetic quality of drinking water.	The surficial zone of the sand and gravel aquifer currently has no beneficial use, and the adjacent surface waters are classified as Class III surface water, per Chapter 62-302, FAC, which is not for drinking water. MCLs are relevant and appropriate to drinking water aquifers. OU 2 contaminants exceed MCLs.
Safe Drinking Water Act MCLGs 40 CFR §141.50-51	Relevant and Appropriate	MCLGs are unenforceable goals under the SDWA.	The surficial zone of the sand and gravel aquifer is a potential, although unlikely, source of drinking water. Some contaminants in the plume below OU 2 — Site 11, 12, 25, 26, 27, 30 are above MCLGs.
Clean Water Act Federal Water Quality Criteria 51 Federal Register 43665	Relevant and Appropriate	Effluent limitations must meet BAT. AWQC are provided for toxic chemicals.	Discharges to water bodies during remediation activities (if required) would have AWQCs as potential goal.
Toxic Substance Control Act 40 CFR §761 Subpart G, Spill Cleanup Policy	Relevant and Appropriate	Establishes the criteria by which the USEPA will determine the adequacy of the cleanup of PCB spills.	PCBs have been identified in soil at OU 2.
State Requirements			
Surface Water Quality Standards Chapter 62-302, FAC	Applicable	Establishes water quality standards for all waters of the state.	Remedial objectives require protection of adjacent surface waters.
Drinking Water Standards, Monitoring, and Reporting Chapter 62-550, FAC	Applicable	Establishes primary and secondary drinking water standards.	The surficial zone of the sand and gravel aquifer currently has no beneficial use and the adjacent surface waters are classified as Class III surface water, per Chapter 62-302, FAC. Nevertheless, primary and secondary drinking water standards are invoked for some COPCs in Chapter 62-777.
Contaminant Cleanup Target Levels Chapter 62-777, FAC	Applicable	Establishes remediation targets for various soil and groundwater exposure scenarios; provides standards for assessing potential cross-media transfer.	Contaminant CTLs are invoked by 62-770, FAC; 62-781, FAC; 62-785, FAC; and Proposed Rule 62-780.
UST, Drycleaners, and Brownfields Cleanup Criteria Chapter 62-770, FAC Chapter 62-781, FAC Chapter 62-785, FAC	Relevant and Appropriate	Establishes requirements for specific types of hazardous substance and petroleum fuel cleanups.	Contaminants found at OU 2 are similar to contaminants covered by these regulations. These regulations have been applied at other locations at NAS Pensacola and, for consistency, should be considered in developing remedial solutions. The state has historically required use of UST regulations at groundwater/surface water contact at NAS Pensacola CERCLA sites. When Proposed Rule 62-780 is accepted, these rules will no longer be applicable.

Table 1
Summary of Potential Chemical-Specific ARARs
NAS Pensacola OU 2 — Sites 11, 12, 25, 26, 27, 30

Requirements	Status	Requirement Synopsis	Application to the RI/FS
Contaminant Site Cleanup Criteria Proposed Rule 62-780	Applicable	Establishes cleanup criteria for contaminated sites. When implemented, it will supersede 62-770, 62-781, and 62-785 for all contaminated sites, with exceptions for USTs, drycleaners, and Brownfields.	Permits site restoration to be performed pursuant to 62-780.680(2), i.e., Risk Management Level II — no further action with institutional controls and, if appropriate, engineering controls.

Table 2
Summary of Potential Location-Specific ARARs
NAS Pensacola OU 2 — Sites 11, 12, 25, 26, 27, 30

Requirements	Status	Requirement Synopsis	Application to the RI/FS
Federal Requirements			
National Environmental Policy Act 40 CFR §6, Appendix A	Applicable	Sets forth USEPA policy carrying out the provisions of Executive Order 11988, Floodplain Management Policy, and Executive Order 11990, Wetlands Protection Policy.	OU 2 is located within a 100-year flood plain and abuts wetlands areas. Remediation activities may disturb these areas.
Endangered Species Act (16 U.S.C. 1531 et seq.); 50 CFR §402 and §200	Applicable	Action must avoid jeopardizing the continued existence of listed endangered or threatened species or modification of their habitat.	Due to the wetland areas in OU 2, endangered species may be present.
Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) 33 CFR §320-330 40 CFR §6.302	Not Applicable	Requires actions to protect fish and wildlife from actions modifying streams or areas affecting streams.	Onsite actions are unlikely to generate impacts to adjacent water bodies.
RCRA Location Requirements 40 CFR §264.18	Relevant and Appropriate	Sets forth minimum requirements for design, construction, and operation of a facility where treatment, storage, or disposal of hazardous waste will be within a 100-year floodplain.	Treatment, disposal, and storage of hazardous materials may take place during remediation of the site. Some wastes may be within the 100-year floodplain.
State Requirements			
Hazardous Waste Chapter 62-730, FAC	Relevant and Appropriate	Sets forth minimum requirements for design, construction, and operation of a facility where treatment, storage, or disposal of hazardous waste will be within a 100-year floodplain.	Treatment, disposal, and storage of hazardous wastes may take place during remediation of the site. OU 2 is in the 100-year floodplain.
UST, Drycleaners, and Brownfields Cleanup Criteria Chapter 62-770, FAC Chapter 62-781, FAC Chapter 62-785, FAC	Relevant and Appropriate	Establishes requirements for specific types of hazardous substance and petroleum fuel cleanups.	Contaminants found at OU 2 are similar to contaminants covered by these regulations. These regulations have been applied at other locations at NAS Pensacola and, for consistency, should be considered in developing remedial solutions. The state has historically required use of UST regulations at groundwater/surface water contact at NAS Pensacola CERCLA sites. When Proposed Rule 62-780 is accepted, these rules will no longer be applicable.
Contaminant Site Cleanup Criteria Proposed Rule 62-780	Applicable	Establishes cleanup criteria for contaminated sites. When implemented, it will supersede 62-770, 62-781, and 62-785 for all contaminated sites, with exceptions for USTs, drycleaners, and Brownfields.	Permits site restoration to be performed pursuant to 62-780.680(2), i.e., Risk Management Level II — no further action with institutional controls and, if appropriate, engineering controls.

Table 3 Summary of Potential Action-Specific ARARs NAS Pensacola OU 2 — Sites 11, 12, 25, 26, 27, 30			
Requirements	**Status**	**Requirement Synopsis**	**Application to the RI/FS**
Federal Requirements			
RCRA Identification of Hazardous Waste 40 CFR §261	Applicable	Criteria for identifying those solid wastes subject to regulation as hazardous waste under RCRA.	Treatment residuals from onsite remediation activities may be hazardous waste. Proper disposal of treatment residuals will be required.
RCRA Generator Standards 40 CFR §262	Relevant and Appropriate	Establishes standards for generators of RCRA hazardous waste(s).	Treatment residuals from onsite remediation activities may be hazardous waste.
RCRA Facility Standards 40 CFR §264	Relevant and Appropriate	Establishes standards for the safe management and storage of RCRA hazardous waste(s).	Treatment residuals from onsite remediation activities may be hazardous waste
RCRA Land Disposal Restrictions 40 CFR §268	Applicable	Certain classes of waste are restricted from land disposal without acceptable treatment.	If hazardous treatment residuals are disposed of offsite, they must comply with LDRs.
Corrective Action Management Units 40 CFR §264.552	Relevant and Appropriate	Established standards for waste acceptance and construction standards for treatment and disposal CAMUs.	Excavated wastes may be stored in onsite disposal CAMUs.
Clean Water Act National Pollutant Discharge Elimination System (NPDES) 40 CFR §122, §125, §129, §136	Applicable	Prohibits non-permitted discharge of any pollutant or combination of pollutants. Standards and limitations are established for discharges to waters of the U.S. from any point source.	Remedial actions may include the discharge of treated groundwater, runoff, or other flows to surface water.
Clean Water Act General Pretreatment Regulations for Existing and New Sources of Pollution 40 CFR §403	Relevant and Appropriate	Establishes the limits for the discharge of pollutants to POTWs and the requirement for pre-treatment if applicable.	Remedial actions may include the discharge of treated groundwater, runoff, or other flows to the FOTWs.
Department of Transportation Rules for the Transport of Hazardous Substances 49 CFR Parts §107 and §171-179	Applicable	Regulates the labeling, packaging, placarding, and transportation of solid and hazardous wastes offsite.	Remedial actions may include the offsite transport and disposal of solid and hazardous wastes.
Clean Air Act Permits Regulation 40 CFR §72	Relevant and Appropriate	Establishes requirements for major source permitting and operation.	Contaminants in groundwater include hazardous air pollutants HAPs and VOCs. Remedial actions may include technologies that have air emissions.
Clean Water Act Wetlands Regulations Part 404 40 CFR §230	Not Relevant and Appropriate	Controls the discharge of dredged or fill materials into waters of the U.S. such that the physical and biological integrity is maintained.	Remedial actions are unlikely to impact water bodies.
Toxic Substance Control Act 40 CFR §761 Subpart D, Storage and Disposal	Applicable	Regulates the storage and disposal of PCB materials at concentrations at 50 ppm or greater.	Remedial actions may include the storage and disposal of PCB contaminated soils.

Table 3 Summary of Potential Action-Specific ARARs NAS Pensacola OU 2 — Sites 11, 12, 25, 26, 27, 30			
Requirements	**Status**	**Requirement Synopsis**	**Application to the RI/FS**
State Requirements			
Stationary Sources — General Requirements Chapter 62-210, FAC Stationary Sources — Emission Standards Chapter 62-296, FAC	Applicable	Establishes emission standards, emission rates, baseline areas, and source classifications for protection of health and welfare. Identifies new source requirements, test, and analysis methods.	Remedial actions may include technologies that have air emissions.
Operation Permits for Major Sources of Air Pollution Chapter 62-213, FAC	Relevant and Appropriate	Establishes the operation permit system for major sources of air pollution (Title V sources).	Contaminants in groundwater include HAPs and VOCs. Remedial actions may include technologies that have air emissions.
Stationary Sources — Preconstruction Review Chapter 62-212, FAC	Relevant and Appropriate	Establishes the general and specific pre-construction review process for proposed activities that require an air construction permit.	Remedial actions may include technologies that have air emissions.
Permits 62 Chapter 62-4, FAC	Relevant and Appropriate	Establishes requirements and procedures for all permitting required by the FDEP, and defines anti-degradation requirements.	Requirements may be applicable to site, depending upon remedial actions and discharge options selected.
Regulations of Storm Water Discharge Chapter 62-25, FAC	Applicable	Establishes design and performance standards and permit requirements for storm water discharges.	Remedial actions may impact storm water discharge quantity and quality at OU 2.

Notes:

AWQC	=	ambient water quality criteria
BAT	=	best achievable technology
CAMU	=	corrective action management unit
CERCLA	=	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COPC	=	chemical of potential concern
CTL	=	cleanup target level
FAC	=	Florida Administrative Code
FDEP	=	Florida Department of Environmental Protection
FOTW	=	federally owned treatment work
HAP	=	hazardous air pollutant
LDR	=	land disposal restrictions
MCL	=	maximum containment level
MCLG	=	maximum containment level goal
NAS	=	Naval Air Station
OSHA	=	Occupational Safety and Health Administration
PCB	=	polychlorinated biphenyl
POTW	=	publicly owned treatment works

Notes: (Continued)

ppm	=	parts per million
RCRA	=	Resource Conservation and Recovery Act
SDWA	=	Safe Drinking Water Act
SMCL	=	secondary maximum containment level
USEPA	=	U.S. Environmental Protection Agency
UST	=	underground storage tank
VOC	=	volatile organic compound

Appendix B

Soil and Groundwater Cleanup Target Level Exceedances

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	011SI00602	011SI01501	011SRA0101	011SRA0201	011SRA0301	011SRA0401	011SRA0501
Aluminum	na	72000	3833	345 J	2170	1050	341	1750	194	4740 J
Antimony	240	26	9.49	5.8 U	6.1 U	6.1 UJ	6.1 UJ	6.2 UJ	6.1 UJ	6.6 U
Arsenic	3.7	0.8	1.56	0.46 U	0.41 U	0.47	0.41 U	0.41 U	0.41 U	3.8 UJ
Barium	87000	110	4.63	0.66 U	1.5 U	6.6 J	0.67 U	4.8 U	0.66 U	134
Beryllium	800	120	0.41	0.19 U	0.2 U	0.2 U	0.2 UJ	0.21 UJ	0.2 UJ	0.22 U
Cadmium	1300	75	1	0.97 U	1 U	1 U	1 U	2 J	1 U	23.3 J
Calcium	na	na	912.37	34.3 UJ	211 U	1490 U	34.1 U	86.7 U	21.7 U	**3950**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	1.9 U	2.3	2.5	4.1	13.4	4.7	**1610 J**
Cobalt	110000	4700	1.87	3.9 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.4 U
Copper	76000	110	5.74	1.9 U	2 U	3.7 J	2 U	8.4	2 U	50
Cyanide (CN)	39000	30	0.52	0.99 U	1 U	1 U	1 U	1 U	1 U	1.2 U
Iron	480000	23000	2745	485 J	1100	958	262	889	275	5980 J
Lead	920	400	7.32	0.38 U	2.3	3.8 J	4.2 J	83.2 J	6.6 J	790 J
Magnesium	na	na	133.33	23.5 U	28.8 U	91.9 U	20.2 U	68.3 U	21.2 U	451 U
Manganese	22000	1600	21.36	1.4 U	27	11.5 U	1 U	3.3 U	0.7 U	65.5
Mercury	26	3.4	0.1	0.08 U	0.09 U	0.1 U	0.1 U	0.09 U	0.09 U	0.13
Molybdenum	9700	na	na	2.3 U	2.4 U					
Nickel	28000	110	6.38	3.9 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	6.2 J
Potassium	na	na	460.67	195 U	203 U	204 U	203 U	206 U	204 U	219 U
Selenium	10000	390	0.62	0.38 U	0.41 U					0.62 J
Silver	9100	390	2.07	0.97 U	1 U	1 U	1 U	1 U	1 U	5.8
Sodium	na	na	107.85	51.5 U	73.3 U	42.9 U	45.4 U	41.1 U	40.7 U	43.9 U
Thallium	na	na	0.82	0.38 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Vanadium	7400	15	5.83	1.9 U	2.9 J	2.1 J	2 U	2.2 J	2 U	11.5
Zinc	560000	23000	16.87	1.5 U	4.6 U	18.5 U	36.3 U	24.2 U	4.8 U	157 J

Notes:
All concentrations expressed in milligrams per kilogram
Bold font indicates an exceedance of GCTL or NASP Reference
Blank cells indicate that the sample was not collected or analyzed for that parameter
na - not analyzed
U - not detected
J - present below the method detection limit but above the instrument detection limit

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	011SRA0601	011SRA0701	011SRA0801	011SRA0901	011SRA1001	011SRA1101	011SRA1201
Aluminum	na	72000	3833	6430 J	3390	3030	3490 J	1020	109	1540
Antimony	240	26	9.49	6.6 U	6.2 U	5.4 U	5.2 U	6.1 U	5.2 U	7.4 U
Arsenic	3.7	0.8	1.56	3.6 UJ	0.41 U	2.4 U	0.75 UJ	0.41 U	0.36 U	0.36 U
Barium	87000	110	4.63	72.9	24.2 J	22.2 J	5.8 J	1.1 U	0.35 U	15.8 J
Beryllium	800	120	0.41	0.37 J	0.32 J	0.31 J	0.17 U	0.2 U	0.17 U	0.19 U
Cadmium	1300	75	1	15.9 J	2.3	11.1	1.9 J	1 U	0.87 U	0.93 U
Calcium	na	na	912.37	3220 U	**14900**	**2780**	2560 U	72.6 U	26.1 U	**1830**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	305 J	13	41.4	5.3 J	2 U	2.3	5.4
Cobalt	110000	4700	1.87	4.4 U	4.1 U	3.6 U	3.5 U	4.1 U	3.5 U	3.7 U
Copper	76000	110	5.74	22	4.3 J	28.2	3.3 J	2 U	1.7 UJ	4.1 J
Cyanide (CN)	39000	30	0.52	1.1 U	1.1 U	1.1 U	1.1 U	1 U	1 U	1 U
Iron	480000	23000	2745	5930 J	2160 J	5030 J	2330 J	611	119 J	1150 J
Lead	920	400	7.32	131 J	89.5 J	413 J	15.7 J	1.2	1.3	488
Magnesium	na	na	133.33	**779 J**	**1360**	**287 J**	82.3 U	35.8 U	6.5 U	68.4 U
Manganese	22000	1600	21.36	91.9	82.3	38.4	53.4	2 U	0.39 U	33.3
Mercury	26	3.4	0.1	0.1 U	0.11 U	0.66	0.09 U	0.08 U	0.08 UJ	0.09 UJ
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	5.7 J	4.1 U	16.9	3.5 U	4.1 U	3.5 U	3.7 U
Potassium	na	na	460.67	221 U	227 J	181 U	174 U	203 U	173 U	186 U
Selenium	10000	390	0.62	0.43 UJ	0.41 U	0.4 U	0.54 J	0.41 U	0.36 U	0.36 U
Silver	9100	390	2.07	1.1 U	1 U	7.3 U	0.87 U	1 U	0.87 U	0.93 U
Sodium	na	na	107.85	44.2 U	88.5 U	154 U	34.9 U	40.7 U	34.6 U	137 U
Thallium	na	na	0.82	0.43 U	0.41 U	0.4 U	0.44 U	0.41 U	0.36 UJ	0.36 UJ
Vanadium	7400	15	5.83	14.5	4.7 J	6.4 J	6.1 J	2 U	1.7 U	2.2 J
Zinc	560000	23000	16.87	88.2 J	174	61.7	20.6 J	4.3 U	5.2 U	11.3 U

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	011SRA1301	011SS00101	011SS00301	011SS01101	011SS01301	012S000201	012S000301
Aluminum	na	72000	3833	5480 J	9910	6710	26700	21700	1310 J	4410 J
Antimony	240	26	9.49	5.8 U	6.2 U	6.3 U	6.6 UJ	607 UJ	12.5	1.2 U
Arsenic	3.7	0.8	1.56	2.8 UJ	3	1.9 J	**4.1 J**	2.7 J	0.65 UJ	0.65 U
Barium	87000	110	4.63	58.8	12.2 J	5 U	9.2 J	7.4 J	3.8 J	32.4 J
Beryllium	800	120	0.41	0.19 U	0.26 J	0.21 U	0.28 J	0.22 U	0.04 U	0.04 U
Cadmium	1300	75	1	12.7 J	1.3	1 U	1.1 U	1.1 U	0.31 U	5.1
Calcium	na	na	912.37	**4100**	**2640**	279 U	508 U	357 U	**7250**	**6340**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	29.3 J	15.3	8.5	33.1 J	24.3 J	3.5	50.3
Cobalt	110000	4700	1.87	3.9 U	4.2 U	4.2 U	4.4 U	4.5 U	0.15 J	1.1 J
Copper	76000	110	5.74	41	35.9 J	2.1 UJ	7.5	6.9	4 J	269
Cyanide (CN)	39000	30	0.52	1.1 U	1 U	1.1 U			0.52 U	0.52 U
Iron	480000	23000	2745	5460 J	6600 J	4300 J	21100	12700	1610	6760
Lead	920	400	7.32	463 J	37.4	14.6	32.5	5.5	28.5	95.9
Magnesium	na	na	133.33	304 U	**279 J**	76.4 U	113 J	118 J	108 J	**148 J**
Manganese	22000	1600	21.36	63.5	61.1	32.6	29.7	30.9	12.8	91.9
Mercury	26	3.4	0.1	0.8	0.09 UJ	0.1 UJ	0.11 U	0.1 U	0.1 U	0.32
Molybdenum	9700	na	na				2.6 U	2.7 U		
Nickel	28000	110	6.38	4.3 J	6.5 J	4.2 U	5.1 J	4.6 J	0.72 J	14.3
Potassium	na	na	460.67	194 U	208 U	209 U	221 U	241 J	43.3 J	61.9 J
Selenium	10000	390	0.62	0.43 UJ	0.4 U	0.42 U	0.44 U	0.45 U	0.9 U	0.89 U
Silver	9100	390	2.07	1.5 J	1 U	1 U	1.1	1.1 U	0.1 U	0.1 U
Sodium	na	na	107.85	38.8 U	41.7 U	41.8 U	91.6 U	114 U	191 U	**263 J**
Thallium	na	na	0.82	0.43 U	0.4 UJ	0.42 UJ	0.44 U	0.45 U	0.92 U	0.91 U
Vanadium	7400	15	5.83	11.9	20.8	11.7	47.9	34.5	2.3 J	5.3 J
Zinc	560000	23000	16.87	177 J	45.1 U	12.5 U	3.1 U	1.3 U	12.8 J	138 J

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	012S000401	012S000501	012S000601	012S000701	012S000801	012S000901	012S001001
Aluminum	na	72000	3833	2440 J	1030 J	1230 J	5420 J	3930 J	4040 J	15100
Antimony	240	26	9.49	0.4 U	0.39 U	0.65 UJ	6.9 J	1.2 J	2.1 J	3.5 J
Arsenic	3.7	0.8	1.56	0.67 UJ	0.65 UJ	0.86 UJ	2.4 J	0.65 U	1.7 J	2.8
Barium	87000	110	4.63	7 J	4.1 J	8.5 J	19.7 J	12.5 J	57.4	22 J
Beryllium	800	120	0.41	0.04 U	0.04 U	0.05 U	0.06 U	0.04 U	0.13 U	0.16 U
Cadmium	1300	75	1	5.1	2.2	6 J	11.2	17.3	49.4 J	562
Calcium	na	na	912.37	**21700**	**54300**	**60800**	**68800**	**16700 J**	**22100**	**25100**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	9.8	4.4	10.9	15.1	21.3 J	25	70.8
Cobalt	110000	4700	1.87	0.71 J	0.32 J	0.68 J	0.73 J	0.9 J	8.8 J	1.9 J
Copper	76000	110	5.74	26 J	58.5 J	39.5 J	129 J	132	370 J	516
Cyanide (CN)	39000	30	0.52	0.52 U	0.51 U	0.67 U	0.53 U	0.52 U	0.53 U	0.78
Iron	480000	23000	2745	2450	840	2500	3560	5760 J	15700	20800
Lead	920	400	7.32	53.5	14.3	68.6	174	191 J	341	198
Magnesium	na	na	133.33	**259 J**	**310 J**	**480 J**	**444 J**	**186 J**	**1430**	**383 J**
Manganese	22000	1600	21.36	26	31.2	52.1	56	58.3 J	182	272
Mercury	26	3.4	0.1	0.1 U	0.09 U	0.12 U	0.6	0.18	1.1	0.1
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	6.4 J	0.62 J	3.7 J	5 J	7 J	17.7	25.7
Potassium	na	na	460.67	80.1 J	62.2 J	71.1 J	124 J	72.2 J	179 J	157 J
Selenium	10000	390	0.62	0.92 U	0.89 U	1.2 U	0.92 U	0.9 U	0.94 U	0.95 U
Silver	9100	390	2.07	0.1 U	0.1 U	0.13 U	0.1 U	0.1 U	0.11 U	0.11 U
Sodium	na	na	107.85	**392 J**	**773 J**	**848 J**	**998 J**	**299 J**	490 U	**500 J**
Thallium	na	na	0.82	0.94 U	0.91 U	1.2 UJ	0.94 U	0.92 U	0.96 UJ	0.97 U
Vanadium	7400	15	5.83	4 J	1.5 J	1.9 J	7.1 J	5.4 J	5.5 J	17
Zinc	560000	23000	16.87	36.5 J	17.6 J	63.4	215 J	146	680	619

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	012S001101	012S001201	012S001301	012S001401	012S001501	012S001601	025S000100
Aluminum	na	72000	3833	2810 J	6020 J		16100 J	15300 J	324 J	1890
Antimony	240	26	9.49	1.1 UJ	0.4 UJ	0.59 J	0.41 UJ	1.1 J	0.4 UJ	9.3 U
Arsenic	3.7	0.8	1.56	0.71 UJ	0.67 UJ	0.66 U	2.1 J	1.4 J	0.67 U	0.61 U
Barium	87000	110	4.63	8.7 J	8.4 J	11.3 J	19 J	29.7 J	2.1 J	5.1
Beryllium	800	120	0.41	0.04 U	0.05 U	0.07 U	0.1 U	0.43 J	0.04 U	0.41 U
Cadmium	1300	75	1	3.2 J	2.1 J	15.5	0.33 U	4.5	0.06 U	1 U
Calcium	na	na	912.37	**11800**	**2850**	**65600 J**	**6240 J**	**30100 J**	175 J	319
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	15.3	15.2	17.7 J	18.2 J	32.6	1.1 J	3.1
Cobalt	110000	4700	1.87	0.21 J	0.32 J	0.79 J	1.2 J	1 J	0.13 U	1.8 U
Copper	76000	110	5.74	45 J	5.5 J	54.8	12.2	37.3	0.6 U	5.1 U
Cyanide (CN)	39000	30	0.52	0.56 U	0.54 U	0.54 U	0.55 U	0.54 U	1.1	0.51 U
Iron	480000	23000	2745	2050	3910	3540 J	8030 J	9220 J	399 J	1380
Lead	920	400	7.32	131	75	55.7 J	20.3 J	275	6.7 J	22.7
Magnesium	na	na	133.33	**248 J**	**162 J**	**479 J**	**228 J**	**2180**	32.6 J	96.6 U
Manganese	22000	1600	21.36	36.2	32.9	85.7 J	390 J	110 J	2.2 J	14.1 U
Mercury	26	3.4	0.1	0.11 U	0.1 U	0.11 U	0.11 U	0.26	0.53	0.1 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	0.31 U	0.72 J	2 J	2.8 J	4.7 J	0.29 U	6.3 U
Potassium	na	na	460.67	91.7 J	87.3 J	99.3 J	170 J	**511 J**	36.3 J	453 U
Selenium	10000	390	0.62	0.97 U	0.92 U	1.2 U	0.95 U	0.94 U	0.92 U	0.61 U
Silver	9100	390	2.07	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	2 U
Sodium	na	na	107.85	229 U	160 U	**799 J**	**249 J**	**325 J**	230 U	26.2 U
Thallium	na	na	0.82	0.99 UJ	0.94 UJ	0.93 U	0.98 U	0.96 U	0.94 U	0.81 U
Vanadium	7400	15	5.83	4.5 J	10 J	7.5 J	21.9	20.4	0.44 U	3.3
Zinc	560000	23000	16.87	65.7	34.4	194	29.4	138	4.1 J	11.8

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	025S000101	025S000202	025S000301	025S000302	025S000402	025S000502	025S000702
Aluminum	na	72000	3833	1910	2150 J	2510	2200	1320		1870
Antimony	240	26	9.49	9.3 U	7.4 U	9.3 UJ	9.3 UJ	9.6 UJ	9.5 UJ	7.3 U
Arsenic	3.7	0.8	1.56	0.72	0.61 U	0.83 U	0.82 U	0.85 U	1.2	0.83 U
Barium	87000	110	4.63	3.1	2.8	2	1.9	3.4	7.7	1.6
Beryllium	800	120	0.41	0.4 U	0.2 U	0.83 U	0.82 U	0.85 U	0.85 U	0.21 U
Cadmium	1300	75	1	1 U	1 U	1 UJ	1 UJ	1.1 U	1.1 UJ	0.62 U
Calcium	na	na	912.37	**3260**	267	185	57.4	343	345	20.1
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	2	1.6 U	2.2	2.2	2.1 U	4.5	2.5
Cobalt	110000	4700	1.87	1.8 U	1.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Copper	76000	110	5.74	5 U	0.83	3.1	3.1 U	3.2 U	3.2	0.91
Cyanide (CN)	39000	30	0.52	0.5 U	0.51 U	0.52 U	0.51 U	0.53 U	0.53 UJ	0.52 U
Iron	480000	23000	2745	1330	1430 J	1760	1610	1250	3010	1400
Lead	920	400	7.32	8.6	4.5 J	1.1	0.8	2.4	16.2	0.89
Magnesium	na	na	133.33	109	91.8 J	88.2	75.8 U	78.5 U	**152**	64.6
Manganese	22000	1600	21.36	25 U	4.2	4.4 U	4 U	2.8 U	17.7 U	3.1
Mercury	26	3.4	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	6.2 U	3.5 U	7.2 U	7.2 U	7.5 U	7.4 U	3.7 U
Potassium	na	na	460.67	451 U	277 U	472 U	470 U	487 U	484 U	264 U
Selenium	10000	390	0.62	0.6 U	0.61 U	0.62 U	0.62 U	0.64 U	0.64 U	0.62 U
Silver	9100	390	2.07	2 U	1.4 U	0.83 U	0.82 U	0.85 U	0.85 U	0.83 U
Sodium	na	na	107.85	38.9 U	51.4 U	150 U	143 U	101 U	**< 159**	31 U
Thallium	na	na	0.82	0.81 U	0.82 U	0.62 U	0.62 U	0.64 U	0.64 U	0.62 U
Vanadium	7400	15	5.83	3.4	2.9	4.1	3	2.3	7.2	3.2
Zinc	560000	23000	16.87	5.4	3	14.6	8.6	2 U	20.9	3.9 U

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	025S000900	025S000902	025S001001	025S001002	025S001101	025S001102	025S001202
Aluminum	na	72000	3833	15300	1950		2260	1880	1730	2240
Antimony	240	26	9.49	9.8 U	7.2 U		7.4 U	7.4 UJ	7.5 U	7.5 U
Arsenic	3.7	0.8	1.56	2.1 J	0.82 U		0.85 U	0.84 U	0.86 UJ	0.86 U
Barium	87000	110	4.63	4.5	1.8		2	4.7	1.7	4.5
Beryllium	800	120	0.41	0.87 U	0.21 U		0.21 U	0.21 U	0.21 U	0.21 U
Cadmium	1300	75	1	1.1 U	0.62 U		0.64 U	9.1	0.64 U	0.64 U
Calcium	na	na	912.37	**3420**	52.7		161	138	115	211
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	10.3	1.9		1.7	8.9	1.8	3.3
Cobalt	110000	4700	1.87	2 U	1.9 U		1.9 U	1.9 U	1.9 U	1.9 U
Copper	76000	110	5.74	3.3 U	1.2		0.85 U	2.3	0.92	1.1 U
Cyanide (CN)	39000	30	0.52	0.54 U	0.51 U	0.5 U	0.53 U	0.53 U	0.54 U	0.54 U
Iron	480000	23000	2745	8280	1480 J		1510	1480	1290	1590
Lead	920	400	7.32	2.7	0.76		1.1	3	1.3	3.1
Magnesium	na	na	133.33	106	64.1		85.7 U	72.1	51.4 U	70.8 U
Manganese	22000	1600	21.36	20.6	3.3		4.2	3.4	1.9 U	3.9
Mercury	26	3.4	0.1	0.23	0.1 U		0.11 U	0.11 U	0.11 U	0.11 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	7.6 U	3.7 U		3.8 U	3.8 U	3.9 U	3.9 U
Potassium	na	na	460.67	496 U	261 U		270 U	268 U	273 U	273 U
Selenium	10000	390	0.62	0.65 UJ	0.62 U		0.64 U	0.63 U	0.64 U	0.64 U
Silver	9100	390	2.07	0.87 U	0.82 U		0.85 U	0.84 U	0.86 U	0.86 U
Sodium	na	na	107.85	62.9	28.7		42.8	34.7	45.9	45.9 U
Thallium	na	na	0.82	0.65 U	0.62 U		0.64 U	0.63 U	0.64 U	0.64 U
Vanadium	7400	15	5.83	20.4	3		3 U	3 J	2.1 U	3.1 U
Zinc	560000	23000	16.87	6	4.8		3.5 U	32.7	7.8	3 U

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	025S001302	025S001500	025S001600	025S001601	025S001602	025S001700	025S001701
Aluminum	na	72000	3833	2690	9270	4490	3480	2330	7130	1230
Antimony	240	26	9.49	8 U	10.7 UJ	11.1 UJ	9.7 U	9.3 U	10.9 UJ	9.6 U
Arsenic	3.7	0.8	1.56	0.91 U	**4.5**	2.1	1.8	0.89	**4.1**	0.85 U
Barium	87000	110	4.63	21.1	88	24.8	20.8	6.1	52.8	4.4
Beryllium	800	120	0.41	0.23 U	0.95 U	0.99 U	0.86 U	0.83 U	1	0.85 U
Cadmium	1300	75	1	0.68 U	34.6	27.9 U	13.1	8.7	31.7	1.1 U
Calcium	na	na	912.37	**945**	**5850**	**15300**	**6730**	**3560**	**12900**	300
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	3.5	234	57.8 J	21.4	9.4	201 J	2.1 U
Cobalt	110000	4700	1.87	2.1 U	12.3	2.2 U	1.9 U	1.9 U	9.6	1.9 U
Copper	76000	110	5.74	2.9	253	44.5	29.8	20.1	204	3.2 U
Cyanide (CN)	39000	30	0.52	0.57 U	0.6 U	0.62 U	0.54 U	0.52 U	1.3 U	0.53 U
Iron	480000	23000	2745	1790	17300	5300	3520	2680	27400	1390
Lead	920	400	7.32	29.2	**1840**	717	128 J	43.9 J	904	13.6 J
Magnesium	na	na	133.33	**237**	**1550**	**541**	**293**	**143**	**1660**	78.4 U
Manganese	22000	1600	21.36	16.2	288	80.7	57.1	41.9	359	19.4
Mercury	26	3.4	0.1	0.11 U	0.54	0.6	0.34	0.1 U	3.7	0.11 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	4.1 U	45.1	10.4	7.5 U	7.3 U	46.3	7.5 U
Potassium	na	na	460.67	289 U	**642**	565 U	492 U	473 U	553 U	486 U
Selenium	10000	390	0.62	0.68 U	0.71 UJ	0.74 UJ	0.65 U	0.62 U	0.73 UJ	0.64 U
Silver	9100	390	2.07	0.91 U	45.5	4.5 U	0.87	0.83 U	23.3	0.85 U
Sodium	na	na	107.85	48.9	94.1	129 U	72.7 U	42.1 U	**155**	23.2 U
Thallium	na	na	0.82	0.68 U	0.71 U	0.74 UJ	0.65 U	0.62 U	0.73 UJ	0.64 U
Vanadium	7400	15	5.83	4	21.4	8.2	6.2	3.7	12.3	2.7
Zinc	560000	23000	16.87	25.4	2010	947	595	658	4360	222

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	025S001800	025S001900	025S001901	025S001902	026S000101	026S000201	026S000301
Aluminum	na	72000	3833	5400	1860	2320	3600	1700	1160	1750
Antimony	240	26	9.49	10.2 U	9.7 U	9.4 UJ	9.9 U	0.4 U	0.39 U	0.39 U
Arsenic	3.7	0.8	1.56	0.9 U	1	1.2	1.1	0.68 U	0.66 U	0.66 U
Barium	87000	110	4.63	7.1	6.6	4.7	29	18 J	1.2 J	1.5 J
Beryllium	800	120	0.41	0.9 U	0.86 U	0.83 U	0.88 U	0.04 U	0.04 U	0.04 U
Cadmium	1300	75	1	1.4	3.4	1.7 U	6.2	0.06 U	0.06 U	0.06 U
Calcium	na	na	912.37	528	**1230**	600	**17600**	416 J	43.6 J	71.8 J
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	6.7	10.7	5.4 J	34.7	2.2	1.9 J	2 J
Cobalt	110000	4700	1.87	2 U	1.9 U	1.9 U	2.8	13.7	0.12 U	0.21 J
Copper	76000	110	5.74	88.8	33.7	10.8 U	42.8	7.3	4.7 J	0.99 J
Cyanide (CN)	39000	30	0.52	0.57 U	0.54 U	0.52 U	0.55 U	0.54 U	0.52 U	0.52 U
Iron	480000	23000	2745	2000	1740	1550	3810	1290	1080	1660
Lead	920	400	7.32	20.5 J	73.9 J	31.6	96.8 J	16.7	1.5	2
Magnesium	na	na	133.33	**201**	**134**	128	**1430**	48.3 J	20.7 U	22.1 U
Manganese	22000	1600	21.36	14.5	27.3	14.3	47.8	95.8	7.3	10.9
Mercury	26	3.4	0.1	0.41	0.2	0.1 U	0.58	0.1 U	0.1 U	0.1 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	7.9 U	7.5 U	7.3 U	10.3	0.62 J	0.29 U	0.29 J
Potassium	na	na	460.67	517 U	490 U	476 U	503 U	64 J	32.7 J	56.2 J
Selenium	10000	390	0.62	0.68 U	0.64 U	0.63 UJ	0.66 U	0.94 U	0.91 U	0.9 U
Silver	9100	390	2.07	0.9 U	4	1.7	3.3	0.37 U	0.1 U	0.1 U
Sodium	na	na	107.85	25.4 U	34.3 U	32.1	112 U	**244 J**	184 U	**247 J**
Thallium	na	na	0.82	0.68 U	0.64 U	0.63 UJ	0.66 U	0.96 U	0.93 U	0.92 U
Vanadium	7400	15	5.83	3.6	3.5	4	6.8	2.9 J	2.2 J	3.2 J
Zinc	560000	23000	16.87	261	941	517	858	9.9	16.4	3.1 J

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	026S000401	026S000501	026S000601	027S000100	027S000101	027S000201	027S000202
Aluminum	na	72000	3833	1010	1460 J	988 J	5990	3840	1520	2000
Antimony	240	26	9.49	0.4 U	0.41 UJ	0.4 U			9.3 UJ	
Arsenic	3.7	0.8	1.56	0.68 U	0.68 U	0.67 U	1.4	2.8	0.61 U	0.99
Barium	87000	110	4.63	2.6 J	3.5 J	3.5 J	8.5	35.8	2.2	3.3
Beryllium	800	120	0.41	0.04 U	0.04 U	0.04 U	0.41 U	0.43 U	0.4 U	0.4 U
Cadmium	1300	75	1	0.06 U	0.06 U	0.06 U	1 U	2.7	1 U	1 U
Calcium	na	na	912.37	126 J	165 J	125 J	510	**2000**	142	178
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	2.8	2 J	1.9 J	5	12.3	2.2 J	3.2
Cobalt	110000	4700	1.87	0.13 U	0.25 J	0.16 J	1.9 U	1.9 U	1.8 U	1.8 U
Copper	76000	110	5.74	2.5 J	1.6 J	1.3 J	5.1 U	6.1	5.1 U	5 U
Cyanide (CN)	39000	30	0.52	0.53 U	0.55 U	0.52 UJ	0.51 U	0.54 U	0.51 U	0.5 U
Iron	480000	23000	2745	962	1110	657 J	3170 J	2780 J	750	1100
Lead	920	400	7.32	6.5	5.2	3.9 J	7.3	263 J	31.1 J	0.87
Magnesium	na	na	133.33	34.1 J	62.9 J	26.4 J	**151**	**208**	96.2 U	95.7 U
Manganese	22000	1600	21.36	16.2	23.5	42.3 J	96.9 J	132 J	4.3	9.9
Mercury	26	3.4	0.1	0.11 U	0.11 U	0.09 U	0.1 U	0.16	0.1 U	0.1 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	0.41 J	0.68 J	0.34 J	6.4 U	6.7 U	6.3 U	6.2 U
Potassium	na	na	460.67	39.1 J	65.8 J	28.9 J	460 U	480 U	452 U	449 U
Selenium	10000	390	0.62	0.93 U	0.94 U	0.92 U	0.62 U	0.64 U		0.6 U
Silver	9100	390	2.07	0.11 U	0.11 U	0.1 U	2.1 U	2.1 U	2 U	2 U
Sodium	na	na	107.85	196 U	195 U	**138 J**	66.2	90.7 U	73.1	102 U
Thallium	na	na	0.82	0.95 U	0.96 UJ	0.94 U	0.82 U	0.86 U	0.81 U	0.8 U
Vanadium	7400	15	5.83	1.8 J	2.2 J	1.6 J	9.7	7.6	1.9	3
Zinc	560000	23000	16.87	9.7	7.6	5.5	12	211	6.6	9.2

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S000301	027S000302	027S000401	027S000402	027S000501	027S000502	027S000601
Aluminum	na	72000	3833	176	1910	1130	6800	2930	2200	2300
Antimony	240	26	9.49	9.7 U	9.4 U	9.4 U	9.3 U	7.9 UJ	7.5 UJ	9.8 UJ
Arsenic	3.7	0.8	1.56	0.63 U	0.61 U	0.75	1.5	1.7	0.96	2.3
Barium	87000	110	4.63	1.1 U	3.7	3.1	14.6	6.8	2	14.9
Beryllium	800	120	0.41	0.42 U	0.41 U	0.41 U	0.4 U	0.22 U	0.21 U	0.27 U
Cadmium	1300	75	1	1.1 U	1.1	23.7	12.2	1.1 U	1 U	3.2
Calcium	na	na	912.37	39.1	257	**1010**	**2680**	489	46.6	**1440**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	2.1 U	2 U	314	120	6.9	1.9	23.3
Cobalt	110000	4700	1.87	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U	2.2 U
Copper	76000	110	5.74	5.3 U	11.5	8.1	35.1	2.7	0.83 U	15
Cyanide (CN)	39000	30	0.52	0.53 U	0.51 U	0.93	0.53	0.55 U	0.52 U	0.68 U
Iron	480000	23000	2745	141	1400	1240	7300	2200	1500	1550
Lead	920	400	7.32	0.74	6.5	43.6	171	82.5	1.3	0.68
Magnesium	na	na	133.33	100 U	97.5 U	97 U	96.1 U	110	86.9	**135**
Manganese	22000	1600	21.36	1.5 U	4.8	13.6	64.4	17.1	3.5 U	18.1
Mercury	26	3.4	0.1	0.11 U	0.1 U	0.56	0.99	0.11 U	0.1 U	0.14 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	6.5 U	6.4 U	6.3 U	6.3 U	3.7 U	3.5 U	4.6 U
Potassium	na	na	460.67	470 U	458 U	456 U	451 U	298 U	280 U	367 U
Selenium	10000	390	0.62	0.63 U	0.61 U			0.66 U	0.62 U	0.81 U
Silver	9100	390	2.07	2.1 U	2 U	2 U	2 U	1.5 U	1.5 U	1.9 U
Sodium	na	na	107.85	88.9 U	85.9	69.4	77.7	98.7	96.8	**124 J**
Thallium	na	na	0.82	0.84 U	0.82 U	0.82 U	0.81 U	0.88 U	0.83 U	1.1 U
Vanadium	7400	15	5.83	1.5 U	3 U	2.3	14.6	5.7	3	4.6
Zinc	560000	23000	16.87	2.5 U	53.7	43.7	145	9.7	3.4	48.9

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S000602	027S000701	027S000702	027S000801	027S000802	027S000901	027S000902
Aluminum	na	72000	3833	2360	13900	4920	10800	2530	17200	30200
Antimony	240	26	9.49	7.5 UJ	9.5 U	9.5 U	9.3 UJ	10 U	7.8 U	7.4 U
Arsenic	3.7	0.8	1.56	0.97	1.2	1.2	2	0.65 U	3.5	**4.4**
Barium	87000	110	4.63	2.4	6.2	6.4	22	7.8	4	13
Beryllium	800	120	0.41	0.21 U	0.44	0.41 U	0.4 U	0.44 U	0.22 U	0.21 U
Cadmium	1300	75	1	1 U	1 U	1 U	2.6	1.1 U	1.1 U	1 U
Calcium	na	na	912.37	55.5	337	206	**1050**	310	42.4	**1430**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	1.9	40.5	4.3	10.8	2.2 U	12.8	20.1
Cobalt	110000	4700	1.87	1.7 U	1.8 U	1.9 U	1.8 U	2 U	1.7 U	2.7
Copper	76000	110	5.74	0.85	5.1 U	5.1 U	16.6	5.4 U	4.8	9.7
Cyanide (CN)	39000	30	0.52	0.52 U	0.51 U	0.51 U	0.5 U	0.54 U	0.54 U	0.51 U
Iron	480000	23000	2745	1860	11800	2800	6190	1550	9100	13100
Lead	920	400	7.32	2	3.6	13.7	11.4	11.8	0.62	0.76
Magnesium	na	na	133.33	93.3	105	97.9 U	**143**	104 U	63.7	**286**
Manganese	22000	1600	21.36	3.6 U	25.1 U	10.1	636	32.5 U	13.1	95.4
Mercury	26	3.4	0.1	0.1 U	0.1 U	0.1 U	0.17	0.11 U	0.11 U	0.1 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	3.5 U	6.4 U	6.4 U	7.3 U	6.8 U	3.7 U	5.2
Potassium	na	na	460.67	282 U	459 U	460 U	451 U	487 U	293 U	278 U
Selenium	10000	390	0.62	0.63 U	0.62 U	0.62 U	0.6 UJ	0.65 UJ	0.65 U	6.2 U
Silver	9100	390	2.07	1.5 U	2.1 U	2.1 U	2 U	2.2 U	1.5 U	1.4 U
Sodium	na	na	107.85	81.8 U	93.6 U	93.1 U	93.9 U	78.8 U	71.5 U	91.3 U
Thallium	na	na	0.82	0.84 U	0.82 U	0.82 U	0.81 U	0.87 U	0.87 U	0.82 U
Vanadium	7400	15	5.83	3.5	24.1	6.5	15.7	3.3	24.2	41.9
Zinc	560000	23000	16.87	3.5 U	9.5	39.8	35.3	11.4	5.4	11.6

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S001002	027S001202	027S001302	027S001402	027S001501	027S001701	027S001702
Aluminum	na	72000	3833	1380	2020	7480	2020	2230	6560	19500
Antimony	240	26	9.49	10 U	9.5 UJ	8 U	7.4 U	9.5 U	9.4 U	9.9 UJ
Arsenic	3.7	0.8	1.56	0.65 U	0.62 U	0.91	0.61 U	0.76	0.83	**5.9**
Barium	87000	110	4.63	1.1	1.8 U	5.2	1.9	2.1	8.3	6.9
Beryllium	800	120	0.41	0.43 U	0.41 U	0.22 U	0.2 U	0.41 U	0.41 U	0.43 U
Cadmium	1300	75	1	1.1 U	1 U	1.1 U	1 U	1 U	1 U	3.3
Calcium	na	na	912.37	467	58	435	109	195	**1730**	**10900**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	2.2 U	2.1 U	6.2	1.6 U	2.3	6.7	21
Cobalt	110000	4700	1.87	2 U	1.9 U	1.8 U	1.6 U	1.9 U	1.8 U	1.9 U
Copper	76000	110	5.74	5.4 U	5.2 U	3.2	0.82 U	5.1 U	5.1 U	8.9
Cyanide (CN)	39000	30	0.52	0.54 U	0.52 U	0.55 U	0.51 U	0.51 U	0.51 U	0.54 U
Iron	480000	23000	2745	955	1430	3820	1610	1710	3640	11800
Lead	920	400	7.32	0.89	0.84	5.7	1	1.1	15.3	51.7
Magnesium	na	na	133.33	103 U	98.7 U	128	81.9	102	**154**	**157**
Manganese	22000	1600	21.36	1.3 U	6.2 U	60.6	3.3	4 U	90.7	19.5
Mercury	26	3.4	0.1	0.11 U	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	0.4
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	6.7 U	6.4 U	3.8 U	3.5 U	6.4 U	6.4 U	6.7 U
Potassium	na	na	460.67	486 U	463 U	299 U	277 U	460 U	458 U	483 U
Selenium	10000	390	0.62	0.65 U	0.62 UJ	0.66 U	0.61 U	0.62 U	0.61 U	0.65 U
Silver	9100	390	2.07	2.2 U	2.1 U	1.5 U	1.4 U	2.1 U	2 U	2.2 U
Sodium	na	na	107.85	28 U	79.5 U	55.5 U	51.4 U	41.1	47	**115**
Thallium	na	na	0.82	0.87 U	0.83 U	0.88 U	0.82 U	0.82 U	0.82 U	0.86 U
Vanadium	7400	15	5.83	3.9	3.3	10.6	2.8	2.7	9	29.1
Zinc	560000	23000	16.87	0.65 U	7.5	5.1	2	2.3	12	18.9

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S001702	027S001900	027S002000	027S002002	027S002102	027S002202	027S002302
Aluminum	na	72000	3833	2400	3200	2830	1820	2340	2150	1930
Antimony	240	26	9.49	9.4 U	9.5 UJ	10.1 UJ	9.8 UJ	9.5 UJ	9.6 UJ	9.5 UJ
Arsenic	3.7	0.8	1.56	1.1	2.1	3.2	0.87 U	0.84 U	1.7	0.84 U
Barium	87000	110	4.63	4	8	13.5	4.5	3	2.9	3.5
Beryllium	800	120	0.41	0.84 U	0.84 U	0.89 U	0.87 U	0.84 U	0.85 U	0.84 U
Cadmium	1300	75	1	1 U	6.3	5.8	1.1 U	1.4	1.1 U	3.5
Calcium	na	na	912.37	145	173	855	182	154	273	122
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	2.1 U	19.3	131	29.5	53.4	2.1 U	3.6
Cobalt	110000	4700	1.87	1.9 U	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U
Copper	76000	110	5.74	3.1 U	28.9 J	27.6	3.3 U	13.1 J	3.2 U	3.2 U
Cyanide (CN)	39000	30	0.52	0.52 U	0.53 U	0.56 U	0.54 U	0.53 U	0.53 U	0.53 U
Iron	480000	23000	2745	1510	2270 J	4150	1380	1800 J	1580	1330 J
Lead	920	400	7.32	2.7	77.5	513 J	2.7	20.7	3.4 U	1.3
Magnesium	na	na	133.33	1.1	78.4	**313**	85	89.3	78.1 U	88.6
Manganese	22000	1600	21.36	8.4	178 J	122	2.2 U	10.6 J	11.1	10.6 J
Mercury	26	3.4	0.1	0.1 U	7.1		0.11 U	0.11 U	0.11 U	0.11 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	7.3 U	7.4 U	7.8 U	7.6 U	7.4 U	7.4 U	7.4 U
Potassium	na	na	460.67	479 U	480 U	510 U	495 U	480 U	485 U	481 U
Selenium	10000	390	0.62	0.36 U	0.63 U	0.67 U	0.65 U	0.63 U	0.64 U	0.63 U
Silver	9100	390	2.07	0.84 U	0.84 U	2.4	0.87 U	0.84 U	0.85 U	0.84 U
Sodium	na	na	107.85	34.9	70.6	123 U	96.7 U	163 U	88.6 U	73.5 U
Thallium	na	na	0.82	0.63 U	0.63 U	0.67 U	0.65 U	0.63 U	0.64 U	0.63 U
Vanadium	7400	15	5.83	3.3	4.7	5.2	2.6	3.5	3	3
Zinc	560000	23000	16.87	192	180 J	293	55	155 J	5.9 U	26.1 J

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S002402	027S002600	027S002602	027S002602	027S002701	027S002702	027S002802
Aluminum	na	72000	3833	1990	1660	1910	2100	2370	1890	2460
Antimony	240	26	9.49	9.7 UJ	9.6 UJ	9.4 UJ	9.9 UJ	9.1 UJ	9.2 UJ	10.9 U
Arsenic	3.7	0.8	1.56	0.86 U	1.6	0.83 U	0.88 U	0.81 U	0.81 U	0.97 U
Barium	87000	110	4.63	2.6	2	2.1	4	2.8	3.8	6.2
Beryllium	800	120	0.41	0.86 U	0.85 U	0.83 U	0.88 U	0.81 U	0.81 U	0.97 U
Cadmium	1300	75	1	1.1 U	1.1 UJ	1 U	1.1 UJ	1 U	1 U	1.2 UJ
Calcium	na	na	912.37	127	149	46.6 UJ	391 J	192	68.7	811
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	2.1 U	2.1 U	2.3	3.1	3.6	3.6	12.9
Cobalt	110000	4700	1.87	1.9 U	1.9 U	1.9 U	2 U	1.8 U	1.8 U	2.2 U
Copper	76000	110	5.74	3.2 U	3.2 U	3.1 U	3.3 U	3 U	3.1 U	10.7
Cyanide (CN)	39000	30	0.52	0.54 U	0.53 UJ	0.52 UJ	0.55 UJ	0.51 U	0.51 U	0.61 U
Iron	480000	23000	2745	1430	1180	1350	1370	1710	1490	1480
Lead	920	400	7.32	1.2	0.76	0.56	1	1.2	0.98	22.7
Magnesium	na	na	133.33	79 U	84.6	77.4	109	116	83	89.1 U
Manganese	22000	1600	21.36	6.3 U	5.7 U	6.1 U	7.9 U	7 U	4.1 U	12.4
Mercury	26	3.4	0.1	0.11 U	0.11 U	0.1 U	0.11 U	0.1 U	0.1 U	0.21
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	7.5 U	7.4 U	7.3 U	7.7 U	7.1 U	7.1 U	8.5 U
Potassium	na	na	460.67	490 U	486 U	476 U	505 U	**535**	464 U	553 U
Selenium	10000	390	0.62	0.64 U	0.64 U	0.62 U	0.66 U	0.61 U	0.61 U	0.73 U
Silver	9100	390	2.07	0.86 U	0.85 U	0.83 U	0.88 U	0.81 U	0.87	0.97 U
Sodium	na	na	107.85	94.9 U	102 U	109 U	107 U	98.9 U	94.6 U	119 U
Thallium	na	na	0.82	0.64 U	0.64 U	0.62 U	0.66 U	0.61 U	0.61 U	0.73 U
Vanadium	7400	15	5.83	2.3	3.1	2.9	3.2	3.6	3.1	4.1
Zinc	560000	23000	16.87	2.7	3.3	8.3 J	4.3 U	3.4	3.2	21.3

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S002902	027S003002	027S003202	027S003302 7/9/1993	027S004000	027S004002
Aluminum	na	72000	3833	1240	2320	2180	2540	2190	2080
Antimony	240	26	9.49	9.5 U	9.2 U	9.4 UJ	9.4 UJ	9.5 U	7.3 U
Arsenic	3.7	0.8	1.56	0.85 U	0.81 U	0.91	0.83 U	0.84 UJ	0.84 U
Barium	87000	110	4.63	1.3	2.3	2.2	2.6	3.9	1.6
Beryllium	800	120	0.41	0.85 U	0.81 U	0.83 U	0.83 U	0.84 U	0.21 U
Cadmium	1300	75	1	1.1 UJ	1 UJ	1 U	1 U	1.1 U	0.63 U
Calcium	na	na	912.37	176	29.9	43.4	170	**4840**	167
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	2.2	2.4	2.1 U	2.1 U	2.1 U	3.1
Cobalt	110000	4700	1.87	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.9 U
Copper	76000	110	5.74	3.2 U	3.1 U	3.1 U	3.1 U	3.2 U	1.3
Cyanide (CN)	39000	30	0.52	0.53 U	0.51 U	0.52 U	0.52 U	0.53 U	0.52 U
Iron	480000	23000	2745	1060	1830	1450	1800	1540	1760 J
Lead	920	400	7.32	1.6	0.98	1.4	0.94	3.4	0.88
Magnesium	na	na	133.33	77.8 U	101	91.8	116	**280**	69.6
Manganese	22000	1600	21.36	5.1 U	3 U	4.2 U	6.3 U	13	4.8
Mercury	26	3.4	0.1	0.11	0.1 U	0.1 U	0.1 U	0.11 U	0.1 U
Molybdenum	9700	na	na						
Nickel	28000	110	6.38	7.4 U	7.1 U	7.3 U	7.7	7.4 U	3.8 U
Potassium	na	na	460.67	483 U	465 U	475 U	476 U	482 U	266 U
Selenium	10000	390	0.62	0.63 U	0.61 U	0.62 U	0.63 U	0.63 UJ	0.63 U
Silver	9100	390	2.07	0.85 U	0.81 U	0.83 U	0.83 U	0.84 U	0.84 U
Sodium	na	na	107.85	99.9 U	109 U	77.5 U	85.2 U	56.3	29
Thallium	na	na	0.82	0.63 U	0.61 U	0.62 U	0.63 U	0.63 U	0.63 U
Vanadium	7400	15	5.83	2.1 U	3.6	3.1	3.6	2.6 U	3.2
Zinc	560000	23000	16.87	6.4	4	4.3	3.1	5.3 U	2.9

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S004100	027S004102	027S004202	027S004302	027S004402	027S004502	027S004602
Aluminum	na	72000	3833	6700	2050	1900	3080	2390	2780	11000
Antimony	240	26	9.49	20.7 U	7.3 U	7.4 UJ	7.4 UJ	7.4 UJ	9.4 U	7.4 UJ
Arsenic	3.7	0.8	1.56	**4.8 J**	0.83 U	0.93	0.85 U	1.2	0.89 J	**4.3**
Barium	87000	110	4.63	19.5	3.7	4.5	4.5	7.4	8.8	6.9
Beryllium	800	120	0.41	1.8 U	0.21 U	0.21 U	0.21 U	0.21 U	0.84 U	0.21 U
Cadmium	1300	75	1	2.3 U	0.62 U	0.63 U	0.64 U	1.2 U	7.9	0.64 U
Calcium	na	na	912.37	858	146	122	293	**76000**	**6580**	**92500 J**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	7.5	2	11.4	5.6	9	31.8	20.9
Cobalt	110000	4700	1.87	4.1 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Copper	76000	110	5.74	6.9 U	1.4	1.1	1.2	5.2	33.6	3.6
Cyanide (CN)	39000	30	0.52	1.1 U	0.52 U	0.53 U	0.53 U	0.53 U	0.52 U	0.53 U
Iron	480000	23000	2745	4480	1630 J	1410	1820	1720	3850	7660
Lead	920	400	7.32	98.7	217	0.95	2.1	63.8	216	6
Magnesium	na	na	133.33	**273**	84.1	68.2	129	**320**	**308**	**1470**
Manganese	22000	1600	21.36	90	18.5	4	10.1	27	46.8	38.2
Mercury	26	3.4	0.1	0.44 U	0.1 U	0.11 U	0.11 U	10.2	0.27 J	0.11
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	16.1 U	3.7 U	5.7	3.8 U	3.8 U	11.6	4.6
Potassium	na	na	460.67	1050 U	264 U	268 U	270 U	270 U	477 U	270 U
Selenium	10000	390	0.62	1.4 UJ	0.62 U	0.63 U	0.64 U	0.64 U	0.63 UJ	0.64 U
Silver	9100	390	2.07	1.8 U	0.83 U	0.85 U	0.85 U	0.85 U	156	0.85 U
Sodium	na	na	107.85	84.8	25.6 U	**110**	42.4	**< 741**	89.1	**673**
Thallium	na	na	0.82	1.4 U	0.62 U	0.63 UJ	0.64 UJ	0.64 UJ	0.63 U	0.64 UJ
Vanadium	7400	15	5.83	9.1	3.8	2.9	4.3	4.5	4.8	22.9
Zinc	560000	23000	16.87	73.4	8.7	50.9	5.9	36.2	198	11.5

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S004702	027S004902	027S005002	027S005200	027S005201	027S005202	027S005300
Aluminum	na	72000	3833	2010	660	2670	2690	9130	11300	5060
Antimony	240	26	9.49	7.2 UJ	7.6 U	9.5 UJ	9.3 UJ	9.4 UJ	12.1 UJ	22.2 UJ
Arsenic	3.7	0.8	1.56	1.7	1.3	0.85 U	1.2	2.9	**3.9**	2.5
Barium	87000	110	4.63	3.7	1.2	2.7	5.9	9	13.8	35.5
Beryllium	800	120	0.41	0.21 U	0.22 U	0.85 U	0.83 U	0.84 U	1.1 U	0.85 U
Cadmium	1300	75	1	0.62 U	0.65 U	1.1 U	20.3	26.1	19.2	67.1
Calcium	na	na	912.37	118	89.2	149	**3660**	**6260**	**3670**	**1250**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	9.7	1.8 U	2.3 J	288 J	223	253	252
Cobalt	110000	4700	1.87	1.9 U	2 U	1.9 U	1.9 U	1.9 U	2.4 U	1.9 U
Copper	76000	110	5.74	2.5	1 U	3.2 U	28.5	137	69.8	87.6
Cyanide (CN)	39000	30	0.52	0.52 U	0.54 U	0.53 U	1.9	1.6	3	0.53 U
Iron	480000	23000	2745	1480	291	1810	2720	10300	7740	7010
Lead	920	400	7.32	4.5	0.94	1.2	101	138	167	**1550**
Magnesium	na	na	133.33	100	29.4 U	**134**	**136**	**151**	**175**	**639**
Manganese	22000	1600	21.36	5.2	3.1 U	5.5	31.9	68.3	44.4	273
Mercury	26	3.4	0.1	2.2	0.11	0.11 U	0.1 U	0.19	0.24	**84**
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	4.6	3.9 U	7.4 U	9.4	20.1	10.9	10.1
Potassium	na	na	460.67	263 U	276 U	483 U	471 U	479 U	615 U	486 U
Selenium	10000	390	0.62	0.62 U	0.65 U	0.63 UJ	0.62 U	0.63 UJ	0.81 U	0.64 UJ
Silver	9100	390	2.07	0.83 U	0.87 U	0.85 U	0.83 UJ	3.1 U	1.1 U	2.9 U
Sodium	na	na	107.85	38.2	38.7 U	23.1 U	48.4	91.3	66.7	49.2
Thallium	na	na	0.82	0.62 UJ	0.65 U	0.63 U	0.62 U	0.63 U	0.81 U	0.64 U
Vanadium	7400	15	5.83	3	1.3 U	4.2 U	4.5	13.4	17.1	8
Zinc	560000	23000	16.87	82.4	1.5 U	5.2 U	73.9	124	140	473

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	027S005301	027S005302	030S000402	030S000502	030S000602	030S001002	030S001102
Aluminum	na	72000	3833	5250	1800	3840 J	2150	2740	1960	3820 J
Antimony	240	26	9.49	9.4 UJ	9.1 UJ	6.2 U	6.1 U	6.2 U	6.2 U	6.4 U
Arsenic	3.7	0.8	1.56	1.5	0.81 U	0.76 J	0.52 J	0.53 J	0.58 J	0.78 J
Barium	87000	110	4.63	19.9	4.4	3.3 J	3.3 J	2.4 J	3.2 U	5.4 J
Beryllium	800	120	0.41	0.83 U	0.81 U	0.21 U	0.2 U	0.21 U	0.21 U	0.21 U
Cadmium	1300	75	1	16.4	1 U	1 U	1 U	1 U	1 U	1.1 U
Calcium	na	na	912.37	**1860**	348	156 U	222 U	79.3 U	316 J	**1770**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	90.5	6.4	2.9	3.7	5	2.1 U	9.6 J
Cobalt	110000	4700	1.87	1.9 U	1.8 U	4.1 U	4.1 U	4.1 U	4.1 U	4.3 U
Copper	76000	110	5.74	40.5	7.5	2.1 U	2 U	2.1 U	2.1 U	2.5 J
Cyanide (CN)	39000	30	0.52	0.93	0.51 U	1 U	0.01 U	1 U	1 U	1.1 U
Iron	480000	23000	2745	5970	1300	2330 J	1610	1970	1630	2170
Lead	920	400	7.32	527	13.5	2 U	3.2 U	2.6 U	1.6 U	7
Magnesium	na	na	133.33	**388**	92.8	75.6 J	86.9 J	106 J	67.9 J	**167**
Manganese	22000	1600	21.36	158	14.4	15 J	8.7	4.7	8.1	19.9 J
Mercury	26	3.4	0.1	21.8	3.4	0.1 U	0.1 U	0.1 U	0.09 U	0.09 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	7.3 U	7.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.3 U
Potassium	na	na	460.67	475 U	461 U	206 U	204 U	207 U	205 U	214 U
Selenium	10000	390	0.62	0.62 UJ	0.61 UJ	0.41 U	0.41 U	0.41 U	0.41 UJ	0.43 U
Silver	9100	390	2.07	1.1 U	0.81 U	1 U	1 U	1 U	1 U	1.1 U
Sodium	na	na	107.85	60.5	31.7	41.2 U	43.6 U	66.4 U	46.4 U	42.8 U
Thallium	na	na	0.82	0.62 U	0.61 U	0.41 U	0.41 U	0.41 U	0.41 UJ	0.43 U
Vanadium	7400	15	5.83	7.4	2.8	5 J	3.5 J	3.7 J	2.4 J	5.3 J
Zinc	560000	23000	16.87	347	23.8	7.2 U	11.9 U	5.6 U	37.9	9.4 J

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	030S001202	030S001602	030S001702	030S001802	030S002002	030S005302	030S005902
Aluminum	na	72000	3833	5170 J	959	1070 J	76.7	1030	1590	2830
Antimony	240	26	9.49	6.3 U	6.4 U	6.3 U	6.1 U	6.1 U	6.6 U	6.5 U
Arsenic	3.7	0.8	1.56	3.4	0.43 U	0.42 U	0.41 U	0.41 J	0.44 U	0.71 J
Barium	87000	110	4.63	6 J	0.79 J	1.5 U	0.41 U	4 J	1.1 J	4.9 J
Beryllium	800	120	0.41	0.21 U	0.21 U	0.21 U	0.2 U	0.2 U	0.22 U	0.22 U
Cadmium	1300	75	1	1.1 U	1.1 U	1 U	1 U	1 U	1.1 U	1.1 U
Calcium	na	na	912.37	473 J	166 U	182 U	40.2 U	254 U	93 U	404 U
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	7.2	3.5	2.1 U	2 U	2 U	2.5	3.5
Cobalt	110000	4700	1.87	4.2 U	4.3 U	4.2 U	4.1 U	4.1 U	4.4 U	4.3 U
Copper	76000	110	5.74	12.8	2.1 U	2.1 U	2 U	2 U	2.2 U	2.2 U
Cyanide (CN)	39000	30	0.52	1.1 U	1.1 U	1 U	1 U	1 U	1.1 U	1.1 U
Iron	480000	23000	2745	3490 J	1650	914	116	856	1200	1790
Lead	920	400	7.32	30.3 U	2.7	3.1	1.8 U	44.7 U	1.6 U	4.1
Magnesium	na	na	133.33	112 J	27.5 U	58.7 U	12.9 J	46.4 U	49.5 U	94 U
Manganese	22000	1600	21.36	28.2 J	4.1	7.3	0.6	17	4.6	26.2
Mercury	26	3.4	0.1	0.27	0.1 U	0.02 U	0.16	0.09 U	0.11 U	0.1 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	4.2 U	4.3 U	4.2 U	4.1 U	4.1 U	4.4 U	4.3 U
Potassium	na	na	460.67	211 U	215 U	209 U	203 U	204 U	218 U	217 U
Selenium	10000	390	0.62	0.42 U	0.43 U	0.42 U	0.41 UJ	0.41 UJ	0.44 U	0.43 U
Silver	9100	390	2.07	1.1 U	1.1 U	1 U	1 U	1 U	1.1 U	1.1 U
Sodium	na	na	107.85	42.3 U	43 U	136 U	40.7 U	40.7 U	67 U	43.5 U
Thallium	na	na	0.82	0.42 U	0.43 U	0.42 U	0.41 UJ	0.41 UJ	0.44 U	0.43 J
Vanadium	7400	15	5.83	8.5 J	4.4 J	2.1 U	2 U	2 U	2.2 U	4.9 J
Zinc	560000	23000	16.87	31.4	5.3 U	3.3 U	4.3 U	8.5	3 U	3.1 UJ

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	030S006102	030S010101	030S010201 8/30/1993	030S010202	030S010301	030S010401
Aluminum	na	72000	3833	2510	451	12700	12800	9380 J	3030
Antimony	240	26	9.49	6.3 U	6.1 UJ	6.3 UJ	6.2 UJ	5.4 U	6.6 U
Arsenic	3.7	0.8	1.56	0.5 J	0.41 U	1.5 J	3.4	1.8 J	0.57 U
Barium	87000	110	4.63	3.7 U	0.83 U	9.3 J	7.3 J	3.7 U	6.9 J
Beryllium	800	120	0.41	0.21 U	0.2 UJ	0.21 UJ	0.21 J	0.42 J	0.22 U
Cadmium	1300	75	1	1.1 U	1 U	9.7 J	14.3 J	0.9 U	4
Calcium	na	na	912.37	283 U	112 U	5040 U	1920 U	395 U	**1540**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	4.1	2.5	16.8	23.1	19.1	8.5
Cobalt	110000	4700	1.87	4.2 U	4.1 U	4.2 U	4.1 U	3.6 U	4.4 U
Copper	76000	110	5.74	2.1 U	2 U	7.5	96.4	3.4 J	7.4
Cyanide (CN)	39000	30	0.52	1 U	1 U	1.1 U	1 U	1.1 U	1.1 U
Iron	480000	23000	2745	1610	334	8620	14400	16100	2130 J
Lead	920	400	7.32	6.4	6.1 J	60.3 J	51.3 J	3.4 U	51.9 J
Magnesium	na	na	133.33	118 J	26.9 U	149 U	126 U	63.5 U	**134 J**
Manganese	22000	1600	21.36	7.2	2.5 U	55.2	29.7	13.6 U	35
Mercury	26	3.4	0.1	0.11 U	0.09 U	0.14	0.09 U	0.11 U	0.1 U
Molybdenum	9700	na	na						
Nickel	28000	110	6.38	4.2 U	4.1 U	4.2 U	4.3 J	3.6 U	4.4 U
Potassium	na	na	460.67	210 U	205 U	211 U	207 U	179 U	220 U
Selenium	10000	390	0.62	0.42 U				0.44 U	0.43 U
Silver	9100	390	2.07	1.1 U	1 U	1.1 U	1 U	0.9 U	1.1 U
Sodium	na	na	107.85	58.5 J	40.9 U	241 U	41.3 U	40.2 U	44 U
Thallium	na	na	0.82	0.42 U	0.41 U	0.42 U	0.41 U	0.44 U	0.43 U
Vanadium	7400	15	5.83	3.4	2 U	20.4	30	33.8	5.4 J
Zinc	560000	23000	16.87	3.4	3.6 U	18.9 U	19.7 U	9.6 U	33.6

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	030S010502	030S010601	030S010802	030S010901	030S011001	030S011102	030S011201
Aluminum	na	72000	3833	1680	2650	137	2130	608	521	1460 J
Antimony	240	26	9.49	6.5 U	6 UJ	6.2 U	6.5 U	6 U	6.1 U	6.1 U
Arsenic	3.7	0.8	1.56	0.69 J	0.82 J	0.41 U	0.77 J	0.43 J	0.4 U	1.7 UJ
Barium	87000	110	4.63	4.5 U	10 J	0.41 U	3 U	2.3 U	1.4 U	1.9 U
Beryllium	800	120	0.41	0.22 U	0.22 J	0.21 U	0.22 U	0.2 U	0.2 U	0.2 U
Cadmium	1300	75	1	1.1 U	1.7 J	1 U	1.1 U	2.5	2.1	1 UJ
Calcium	na	na	912.37	436 U	**16100**	43 U	1650 U	116 U	97.8 U	81.8 U
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	13.5	13.6	5.7	5	155	89.6	39.8 J
Cobalt	110000	4700	1.87	4.3 U	4 U	4.1 U	4.3 U	4 U	4 U	4 U
Copper	76000	110	5.74	4.2 J	4.8 J	2.1 U	2.2 U	4.8 J	5.4	3.8 J
Cyanide (CN)	39000	30	0.52	1.1 U	1 U	1.1 U	1.1 U	1 U	1 U	1 U
Iron	480000	23000	2745	1310	2410	178 U	1560	610	547	1800 J
Lead	920	400	7.32	53.1	2.1 J	0.41 U	5.8	54.1	1.5	30.8 J
Magnesium	na	na	133.33	78.7 U	419 U	12.5 U	89.3 U	27.6 U	17.1 U	34.6 U
Manganese	22000	1600	21.36	17.4	36.8	1.3 U	18	8.3 U	5.9 U	4.8 U
Mercury	26	3.4	0.1	0.09 U	0.09 U	0.1 U	0.1 U	0.09 U	0.08 U	0.1 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	4.3 U	4 U	4.1 U	4.3 U	4 U	4 U	4 U
Potassium	na	na	460.67	216 U	201 U	207 U	217 U	201 U	202 U	202 U
Selenium	10000	390	0.62	0.43 U		0.41 U	0.43 U	0.4 U	0.4 U	0.49 J
Silver	9100	390	2.07	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Sodium	na	na	107.85	43.3 U	127 U	41.3 U	59.7 U	63.7 U	40.5 U	40.4 U
Thallium	na	na	0.82	0.43 U	0.4 U	0.41 U	0.43 U	0.4 U	0.4 U	0.39 U
Vanadium	7400	15	5.83	5.6 J	10.5	2.1 U	3.8 J	2 J	2 U	4.9 J
Zinc	560000	23000	16.87	20.9 U	30.1 U	2.5 U	11 U	12.5 U	6 U	11.6 U

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	030S011301	030S011401	030S011501	030S011701	030S011802	030S012001	030S012101
Aluminum	na	72000	3833	562 J	753	800 J	2290	8050 J	885	389
Antimony	240	26	9.49	6.3 U	5.2 U	5.8 U	5.9 U	6.3 U	6.2 UJ	6.1 UJ
Arsenic	3.7	0.8	1.56	0.41 U	0.4 U	0.38 UJ	0.32 U	0.5 UJ	0.41	0.41 U
Barium	87000	110	4.63	0.48 U	2.3 U	1.7 U	1.6 U	4.6 U	2.3 U	1 U
Beryllium	800	120	0.41	0.23 J	0.17 U	0.19 U	0.2 U	0.21 U	0.21 UJ	0.2 UJ
Cadmium	1300	75	1	1 U	0.87 U	0.97 UJ	0.98 U	1 UJ	1 U	1 U
Calcium	na	na	912.37	30.1 U	**4620**	1610 U	84.6 U	**15900**	44.5 U	147 U
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	2.1	2.9	1.9 UJ	5.7	11.5 J	17.4	15.5
Cobalt	110000	4700	1.87	4.2 U	3.5 U	3.9 U	3.9 U	4.2 U	4.1 U	4.1 U
Copper	76000	110	5.74	2.1 U	1.7 U	1.9 U	2 U	5.8	4.6 J	2 U
Cyanide (CN)	39000	30	0.52	1.1 U	1 U	1 U	1 U	1 U	1 U	1 U
Iron	480000	23000	2745	394	649 J	573 J	1360 J	3670 J	819	267
Lead	920	400	7.32	2 U	1.9 J	7.8 J	1.7 J	7.2 J	19 J	7.1 J
Magnesium	na	na	133.33	19.7 U	136 U	41.7 U	22 U	**471 J**	40.5 U	20.8 U
Manganese	22000	1600	21.36	1.8 U	9.5	9.9 U	22.4	66.7	6.9 U	1.3 U
Mercury	26	3.4	0.1	0.09 U	0.09 U	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	4.2 U	3.5 U	3.9 U	3.9 U	4.2 U	4.1 U	4.1 U
Potassium	na	na	460.67	210 U	174 U	193 U	196 U	208 U	206 U	204 U
Selenium	10000	390	0.62	0.41 U	0.4 U	0.38 UJ	0.32 U	0.38 UJ		
Silver	9100	390	2.07	1 U	0.87 U	0.97 U	0.98 U	1 U	1 U	1 U
Sodium	na	na	107.85	47.4 U	34.9 U	38.7 U	39.2 U	92.5 U	44.4 U	40.8 U
Thallium	na	na	0.82	0.41 U	0.4 U	0.38 U	0.32 U	0.38 U	0.41 U	0.41 U
Vanadium	7400	15	5.83	2.1 U	1.7 U	1.9 U	3.9 J	12.1 J	2.8 J	2 U
Zinc	560000	23000	16.87	9.3 U	10.5 U	13.6 U	12.1 U	20.1 J	11.2 U	13.7 U

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	030S012201	030S012301	030S012401	030S012501	030S012602	030S012701	030S012801
Aluminum	na	72000	3833	797	1630	1480	2650	542 J	1450	1500
Antimony	240	26	9.49	6.1 UJ	6.1 U	6.8 UJ	6.7 UJ	6.4 U	6.2 U	6.2 U
Arsenic	3.7	0.8	1.56	0.41 U	0.38 U	0.46 UJ	2.1 UJ	0.42 U	0.41 U	0.57 J
Barium	87000	110	4.63	2.8 U	9.3 J	6.1 BJ	12.6 J	2 U	3.3 U	2.7 U
Beryllium	800	120	0.41	0.2 UJ	0.34 J	0.23 U	0.22 U	0.21 U	0.21 U	0.21 U
Cadmium	1300	75	1	1.1 J	9.7	7.5 U	15.1	3.1	2.1	2
Calcium	na	na	912.37	661 U	**4580**	189 U	296 U	118 U	197 U	172 U
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	33.4	204	181 J	395 J	74.2	68.7	57.5
Cobalt	110000	4700	1.87	4.1 U	4 U	4.6 U	4.4 U	4.2 U	4.1 U	4.2 U
Copper	76000	110	5.74	3.7 J	12.9 J	20.2	109	7.4	33.4	20.7 J
Cyanide (CN)	39000	30	0.52	1 U	1 U	2.7 U	2.7 U	1.1 U	1 U	1 U
Iron	480000	23000	2745	571	512 J	882	1840	223	697	808 J
Lead	920	400	7.32	21.8 J	90.6	301	334	17.2	88.1 J	90.9
Magnesium	na	na	133.33	44.3 U	**1030**	42.6 J	84.7 J	20.6 U	67 J	45.3 U
Manganese	22000	1600	21.36	16.5	18.8	5.8 U	15.5	1.2 U	5.8 U	4.7 U
Mercury	26	3.4	0.1	0.09 U	0.08 UJ	0.47	0.35	0.1 U	0.1 U	0.09 UJ
Molybdenum	9700	na	na							
Nickel	28000	110	6.38	4.1 U	4 U	4.6 U	9.4	4.2 U	4.1 U	4.2 U
Potassium	na	na	460.67	204 U	202 U	228 U	222 U	212 U	207 U	208 U
Selenium	10000	390	0.62		0.38 U	0.88 J	0.94 J	0.42 U	0.53 J	0.4 U
Silver	9100	390	2.07	1 U	1 U	1.1 U	3.3 U	1.1 U	1 U	1 U
Sodium	na	na	107.85	40.9 U	44.5 U	60.3 U	69.4 U	42.5 U	41.5 U	41.6 U
Thallium	na	na	0.82	0.41 U	0.38 UJ	0.46 U	0.41 U	0.42 U	0.41 U	0.4 UJ
Vanadium	7400	15	5.83	2 U	2 U	2.5 J	5.4 J	2.1 U	2.5 J	2.4 J
Zinc	560000	23000	16.87	16.7 U	19.6 U	20.1 U	41.5 U	11.1 U	13.1	13.7 U

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	030S012901	030S013001	030S013401	030S013501	030S013701	030S013801	030S013901
Aluminum	na	72000	3833	1750	2700	2830 J	1170 J	12400 J	2500 J	3000 J
Antimony	240	26	9.49	6.5 U	7.9 UJ	7.8 U	5.9 U	6.7 U	6.1 U	6 U
Arsenic	3.7	0.8	1.56	0.43 U	0.76 J	0.52 U	0.41 U	**4.7**	1.7 U	0.63 J
Barium	87000	110	4.63	5.4 U	9 J	6.7 J	2.2 J	158 J	7.5 U	5.6 J
Beryllium	800	120	0.41	0.22 U	0.26 U	0.26 U	0.2 U	1.3	0.2 U	0.2 U
Cadmium	1300	75	1	1.6	1.3 U	4.2 J	0.99 U	35.9 J	3.5	4.8 J
Calcium	na	na	912.37	410 U	**1990 J**	496 J	37.7 UJ	**24800 J**	**3850**	298 UJ
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	23.1	5.6 J	37.3 J	4.6	116 J	9.8	15.1 J
Cobalt	110000	4700	1.87	4.4 U	5.3 U	5.2 U	4 U	18.7	4.1 U	4 U
Copper	76000	110	5.74	2.2 UJ	6.4 J	5 J	2.8 J	91	16.1	4.7 J
Cyanide (CN)	39000	30	0.52	1.1 U	3.2 U	1.3 UJ	1 UJ	1.1 J	0.01 U	1 UJ
Iron	480000	23000	2745	912 J	1630	1050	761	7080	2820 J	1530
Lead	920	400	7.32	43.5	31.8	29.7	18.9	317	71.4 J	39
Magnesium	na	na	133.33	87.2 U	88.2 J	118 J	43.6 U	**3130**	**412 J**	93.7 J
Manganese	22000	1600	21.36	17.1	41.2	7.6 J		266 J	14.4 U	27.3 J
Mercury	26	3.4	0.1	0.1 UJ	0.11 U	0.12 U	0.09 U	0.09 U	0.58	0.1 U
Molybdenum	9700	na	na			3.1 U	2.4 U	6.3	2.5 U	2.4 U
Nickel	28000	110	6.38	4.4 U	5.3 U	5.2 U	4 U	48.5	4.1 U	4 U
Potassium	na	na	460.67	218 U	265 U	305 U	198 U	1010 U	205 U	199 U
Selenium	10000	390	0.62	0.43 U	0.82 J	0.52 U	0.41 U	0.45 U	0.41 U	0.42 U
Silver	9100	390	2.07	1.1 U	1.3 U	1.3 U	0.99 U	1.2 J	1 U	1 U
Sodium	na	na	107.85	43.6 U	146 U	**< 127 J**	55.6 J	**182 J**	74 U	54.1 J
Thallium	na	na	0.82	0.43 UJ	0.53 U	0.52 U	0.41 U	0.45 U	0.41 U	0.42 U
Vanadium	7400	15	5.83	2.6 J	4.1 J	4 J	2 J	15.9	5.9 J	4.2 J
Zinc	560000	23000	16.87	24.2 U	27 U	15.7 J	3.4 UJ	428 J	60.4 J	13.3 J

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	030S014001	030S014101	030S014201	030S014301	030S014401	030S014501	030S014701
Aluminum	na	72000	3833	9880 J	273	1010	15900 J	2000	1560	1920
Antimony	240	26	9.49	6 U	6.2 U	6.1 U	6.5 U	6.1 U	6.1 U	6.1 U
Arsenic	3.7	0.8	1.56	1.5 J	0.44 U	0.39 U	3.6	0.39 U	0.65 J	**4.8**
Barium	87000	110	4.63	12 J	0.53 U	1.5 U	6 J	6.8 U	3.1 U	4.8 U
Beryllium	800	120	0.41	0.21 U	0.21 U	0.2 U	0.22 U	0.2 U	0.2 U	0.2 U
Cadmium	1300	75	1	6 J	1 U	1 U		1.3	1 U	1 U
Calcium	na	na	912.37	780 J	233 U	58.5 U	286 UJ	**5840**	397 U	450 U
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	12 J	2.1 U	2 U	14 J	3.6	2 U	9.6
Cobalt	110000	4700	1.87	5 U	4.6	4.1 U	4.3 U	14.4	15.5	4.1 U
Copper	76000	110	5.74	28	2.1 U	2 U	4.8 J	2.9 J	2 U	45.9
Cyanide (CN)	39000	30	0.52	1 UJ	1.1 U	1 U	1.1 UJ	1.1 U	1 U	1 U
Iron	480000	23000	2745	4760	228	657	7720	1550	1490	2280
Lead	920	400	7.32	104			5.9		4.1	
Magnesium	na	na	133.33	**142 J**	18.9 U	53.5 J	**143 J**	**319 J**	97.6 U	101 J
Manganese	22000	1600	21.36	64 J	1.3 U	5.4 U	14.2 J	13.1	8.2 U	21.7
Mercury	26	3.4	0.1	0.09 U	0.09 U	0.08 U	0.09 U	0.09 U	0.09 U	0.09 U
Molybdenum	9700	na	na	2 J			2.6 U			
Nickel	28000	110	6.38	6 J	4.1 U	4.1 U	4.3 U	4 U	4.1 U	4.1 U
Potassium	na	na	460.67	200 U	205 U	242 J	216 U	327 J	204 U	204 U
Selenium	10000	390	0.62	0.4 U	0.44 U	0.39 U	0.43 U	0.39 U	0.41 U	0.41 U
Silver	9100	390	2.07	2 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Sodium	na	na	107.85	0.34 J	41.1 U	47.7 J	76.8 J	106 J	53.7 U	40.7 U
Thallium	na	na	0.82	0.4 U	0.44 U	0.39 U	0.43 U	0.39 U	0.41 U	0.41 U
Vanadium	7400	15	5.83	14	2.1 U	2 U	21.7	3.8 J	2.2 J	3.2 J
Zinc	560000	23000	16.87	30 J	2.3 U	3.3 U	2.5 UJ	16.1	2.6 U	25.1

Table B-1: Summary of Surface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	NASP Reference	030S014901	030S015001	030S015002	030S015101	030S015302	030S015402
Aluminum	na	72000	3833	2890 J	2760	2940 J	11500 J	19300 J	4270 J
Antimony	240	26	9.49	6 U	6.2 UJ	6.2 U	6.1 U	7.6 J	6.6 U
Arsenic	3.7	0.8	1.56	0.85 U	0.7 B	0.41 U	3.6 J	2.5	1.3 J
Barium	87000	110	4.63	4.2 U	6 J	3.3 U	10.4 U	8.7 J	25.8 J
Beryllium	800	120	0.41	0.2 U	0.21 U	0.21 U	0.2 U	0.48 J	0.31 J
Cadmium	1300	75	1	0.99 U	1 U	1 U	1.2	1 U	1.1 U
Calcium	na	na	912.37	**7150 J**	**38000 J**	473 U	**12800 J**	526 U	**39200**
Chromium	420 - Cr(VI)	210 - Cr(VI)	6.13	4.4	7.2 J	3.9 U	19	16	27.1
Cobalt	110000	4700	1.87	4 U	4.1	4.1 U	4.1 U	4.1 U	4.4 U
Copper	76000	110	5.74	2 J	5.5	2.1 U	7.6	4.2	4.9 J
Cyanide (CN)	39000	30	0.52	1 U	2.5 U	1 U	0.01 U	1.1 UJ	1.1 U
Iron	480000	23000	2745	2080 J	1760	1880	7020 J	12600	2470
Lead	920	400	7.32	7.5 J	28.8	0.88 J	58.4 J	6.1	20.9
Magnesium	na	na	133.33	116 U	**409 J**	**165 J**	**597 J**	87.3 U	**6330**
Manganese	22000	1600	21.36	26.8	37.8	5.7	66.2	46.8	51
Mercury	26	3.4	0.1	0.1 U	0.08 U	0.02 U	0.1 U	0.1 U	0.1 U
Molybdenum	9700	na	na	2.4 U			2.5 U		
Nickel	28000	110	6.38	4 U	4.1 U	4.1 U	4.1 U	4.1 U	4.4 U
Potassium	na	na	460.67	199 U	207 U	207 U	205 U	204 U	218 U
Selenium	10000	390	0.62	0.42 U	0.41 U	0.41 U	0.43 U	0.44 U	0.44 U
Silver	9100	390	2.07	0.99 U	1 U	1 U	1 U	1 U	1.1 U
Sodium	na	na	107.85	122 U	352 U	157 U	146 U	40.8 U	158 U
Thallium	na	na	0.82	0.42 U	0.41 U	0.41 U	0.43 U	0.44 U	0.44 U
Vanadium	7400	15	5.83	5.2 J	5.2 J	4 J	21.3	29.3	9.3
Zinc	560000	23000	16.87	8.7 J	14.6 U	4.2 U	20.8 J	1 U	21 U

Table B-2: Summary of Subsurface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater Based Leachability SCTL	Residential Direct Exposure SCTL	NASP Reference	011S001506		011SLF1206		011SLF5S01		012S000705		012S000805	
				1993	2003	1993	2003	1993	2003	1993	2003	1993	2003
Aluminum	*	72000	3833	5800	2000	486	890	4740 J	3700	3360 J	1500	1700 J	440
Antimony	5	26	9.49	6.2 U	0.64 U	6.1 U	0.39 U	6.6 U	0.42 U	2.8 U	0.37 U	0.52 J	0.39 U
Arsenic	29	0.8	1.56	1.5 J	0.75 J	1.1 J	0.4 U	3.8 UJ	**2.5**	0.67 UJ	0.51 J	0.65 U	0.4 U
Barium	1600	110	4.63	8.2 U	9.7	13.6 J	5.1	134	34	12.1 J	3.5	6.9 J	2.2
Beryllium	63	120	0.41	0.21 U	0.038 J	0.2 U	0.01 U	0.22 U	0.091 J	0.08 J	0.0097 U	0.04 U	0.01 U
Cadmium	8	75	1	7.4	0.29 J	6.4	3.6	**23.3** J	5.4	**10.4**	0.64	6.8	1.3
Calcium	NA	NA	912.37	60900	2600	306 J	470	3950	1300	10000	4500	3160 J	46 J
Chromium	38 - Cr(VI)	210 - Cr(VI)	6.13	12.4	**48**	3	2.9	**1610** J	**270**	13.1	3.8	8.7 J	2
Cobalt	*	4700	1.87	4.1 U	0.23 J	4.1 U	0.072 U	4.4 U	0.5 J	0.51 J	0.15 J	0.53 J	0.072 U
Copper	*	110	5.74	4.2 J	3.6	2 UJ	3.1	50	22	89	5.9	32.5	0.41 J
Cyanide	40	30	0.52	6.7	na	1.2 U	na	1.2 U	na	0.53 U	na	0.51 U	na
Iron	*	23000	2745	4480	1200	334 J	490	5980 J	5000	4090	1400	1660 J	380
Lead	*	400	7.32	16.9	24	407	200	790 J	160	133	8.8	63.6 J	0.46 J
Magnesium	NA	NA	133.33	514 U	260	34.7 U	23 J	451 U	220	1080	220	76.8 J	18 J
Manganese	*	1600	21.36	119	10	2.6 U	10	65.5	41	49.4	11	15.5 J	1.2
Mercury	2.1	3.4	0.1	0.09 U	0.013 J	0.1 J	0.016 J	0.13	0.069	0.92	0.063	0.11	0.0049 J
Nickel	130	110	6.38	4.1 U	0.88 J	4.1 U	0.38 J	6.2 J	2.1 J	2 J	0.72 J	1.8 J	0.17 J
Potassium	NA	NA	460.67	205 U	81 J	203 U	13 J	219 U	68 J	84.7 J	21 J	37.1 J	16 J
Selenium	5	390	0.62	0.41 U	0.72 U	0.44 U	0.44 U	0.62 J	0.48 U	0.93 U	0.42 U	0.9 U	0.44 U
Silver	17	390	2.07	1.2 J	0.17 U	1 U	0.1 U	5.8	0.65 J	0.11 U	0.097 U	0.1 U	0.1 U
Sodium	NA	NA	107.85	489 U	79 J	40.5 U	34 U	43.9 U	61	326 J	37 J	185 U	30 U
Thallium	NA	NA	0.82	0.41 U	1.1 U	0.44 UJ	0.68 U	0.41 U	0.74 U	0.95 U	0.64 U	0.92 U	0.68 U
Vanadium	980	15	5.83	11	4	2 U	1	11.5	12	4.3 J	2.7	2.4 J	0.44 J
Zinc	6000	23000	16.87	8.9 U	8.3	15.8 U	7.6	157 J	68	541 J	17	66	5.3

Notes:
All concentrations expressed in milligrams per kilogram
* - Developed via SPLP
Bold font indicates an exceedance of SCTL or NASP Reference
NA - not applicable
na - not analyzed
U - not detected
J - present below the method detection limit but above the instrument detection limit
011SLF5S01 (a surface soil sample) was screened against the residential direct exposure SCTLs

Table B-2: Summary of Subsurface Soil Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater Based Leachability SCTL	Residential Direct Exposure SCTL	NASP Reference	012S000905		012S001005		012S001305		012S001610	
				1993	2003	1993	2003	1993	2003	1993	2003
Aluminum	*	72000	3833	748 J	2000	4000 J	6600	1590 J	870	14800 J	1400
Antimony	5	26	9.49	1.8 UJ	0.69 J	0.39 UJ	0.44 U	0.4 UJ	0.45 U	**11.4** J	0.41 U
Arsenic	29	0.8	1.56	0.65 UJ	0.82 J	0.65 U	1.7	0.67 UJ	0.46 U	4.7	0.42 U
Barium	1600	110	4.63	10.6 J	18	7.4 J	5.7	6.7 J	3.7	28.7 J	2.2
Beryllium	63	120	0.41	0.04 U	0.017 J	0.04 U	0.046 J	0.04 U	0.012 U	0.27 U	0.011 U
Cadmium	8	75	1	**13.9** J	6.7	**66.5**	1.9	**11.3** J	4	**243**	0.043 U
Calcium	NA	NA	912.37	2040	12000	2770 J	1700	2830	82	55800 J	140
Chromium	38 - Cr(VI)	210 - Cr(VI)	6.13	10.8	10	8.4 J	5.8	8.1	1.7	**203** J	1.4
Cobalt	*	4700	1.87	0.41 J	0.41 J	0.46 J	0.26 J	0.2 J	0.12 J	3.7 J	0.23 J
Copper	*	110	5.74	133 J	38	26.8	2.4	6.3 J	1.3 J	515	0.8 J
Cyanide	40	30	0.52	0.52 U	na	0.53 U	na	0.53 U	na	0.52 U	na
Iron	*	23000	2745	3040	4900	3540 J	4200	1320	590	42600 J	1300
Lead	*	400	7.32	74	96	36 J	4.4	7.7	0.69	883 J	1.1
Magnesium	NA	NA	133.33	58.7 U	880	89.7 J	110	51.8 U	28 J	811 J	32 J
Manganese	*	1600	21.36	29.5	46	37.6 J	47	22.2	8.3	375 J	11
Mercury	2.1	3.4	0.1	1.7	0.099	0.11 U	0.013 J	0.1 U	0.0053 J	0.1 U	0.0075 J
Nickel	130	110	6.38	6.5 J	5.1	3.5 J	0.92 J	0.81 J	0.68 J	50.7	0.66 J
Potassium	NA	NA	460.67	26.9 U	47 J	66.2 J	41 J	48.9 U	20 J	277 J	25 J
Selenium	5	390	0.62	0.89 U	0.4 U	0.9 U	0.5 U	0.92 U	0.51 U	2.6 U	0.46 U
Silver	17	390	2.07	0.12 J	0.32 J	0.1 U	0.12 U	0.1 U	0.12 U	0.1 U	0.11 U
Sodium	NA	NA	107.85	181 U	93	177 U	29 U	186 U	29 U	746 J	26 U
Thallium	NA	NA	0.82	0.91 UJ	0.62 U	0.92 U	0.76 U	0.94 UJ	0.78 U	0.93 U	0.71 U
Vanadium	980	15	5.83	1 J	2.7	5.8 J	11	2.4 J	0.8 J	14.7	1.3
Zinc	6000	23000	16.87	136	150	89.7	7.7	94.6	17	854	1.5 J

Table B-3: Summary of Groundwater Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	NASP Reference	11GI02						11GI04						11GI08			
					1993		1995		2003		1993		1995		2003		1993		2003	
Aluminum	200	13	13	3882.8	**8730**		**1110**	J	**510**		**4880**		**363**		**230**		**824**		170	J
Antimony	6	4300	4300	30.2	**41**	UJ	2.3	U	3.8	U	**44**	UJ	2.3	UJ	3.8	U	21	U	3.8	U
Arsenic	50	50	50	2.8	13		12.6		6.1	J	6	J	1.5	UJ	3.9	U	5	J	7.1	J
Barium	2000	NA	NA	13.2	27	J	4.1	U	8.3	J	18	J	5.6	UJ	6.7	J	37	J	43	
Beryllium	4	0.13	0.13	1.1	1	J	0.08	UJ	0.1	U	1	U	0.08	U	0.1	U	1	U	0.1	U
Cadmium	5	9.3*	9.3	3.4	2	U	0.22	U	0.4	U	2	U	0.22	U	0.4	U	2	U	0.4	U
Calcium	NA	NA	NA	17560	2570	J	1190	U	3000		6720		3680		4100		109000		91000	
Chromium	100	NA	NA	35	23	J	2.9	U	1.1	J	10	J	0.86	U	0.9	U	3	U	0.96	J
Cobalt	150	NA	NA	4.1	4	U	0.67	U	0.7	U	4	U	0.67	UJ	1.2	J	4	U	0.7	U
Copper	1000	3.7*	2.9	16.2	24	J	0.96	U	0.8	U	10	U	1.6	U	0.8	U	3	U	0.8	U
Cyanide	200	5.2	1	NA	20	U	na		na		20	U	na		na		20	U	na	
Iron	300	1000	300	1707.8	**7310**	J	**1030**		**770**		**20000**	J	579		280		**929**	J	**780**	
Lead	15	8.5*	8.5	1.6	14	J	0.81	U	1.9	U	4	J	1	U	1.9	U	2	U	1.9	U
Magnesium	NA	NA	NA	2872.6	724	R	181	U	750		821	R	542		770		52700	R	44000	
Manganese	50	NA	NA	22	29	J	1.8	U	11		21	J	24.2		34		**71**		**140**	
Mercury	2	0.012	0.025	0.2	0.2	U	0.06	U	0.1	U	0.2	U	0.06	U	0.1	U	0.2	U	0.1	U
Nickel	100	8.3*	8.3	39.9	18	J	1.1	U	1.2	U	7	U	1.7	U	1.2	U	7	U	2.4	J
Potassium	NA	NA	NA	12167	1110	U	2860		620	J	1210	J	637	U	470	J	14000		15000	
Selenium	50	5	71	3.9	6	J	2	UJ	4.3	U	2	U	2	UJ	4.3	U	2	U	4.3	U
Silver	100	0.07	0.4	4	7	U	1	U	1	U	6	U	1	U	1	U	4	UJ	1	U
Sodium	NA	NA	NA	18345	19400		20800		16000		13500		12500		14000		595000		410000	
Thallium	2	6.3	6.3	3.6	2	UJ	0.95	U	6.6	U	2	UJ	0.95	U	6.6	U	10	U	6.6	U
Vanadium	53	NA	NA	9.6	36	J	6.4	J	1.1	J	30	J	1.5	U	1	U	4	U	1	U
Zinc	5000	86*	86	153.2	26	U	4.3	U	2.6	J	10	U	9.7	U	3.4	J	8	U	8.4	J

Notes:
All results in micrograms per liter
Bold font indicates an exceedance of GCTL or NASP Reference
*In accordance with 62-302, F.A.C.
NA - not applicable
na - not analyzed
U - not detected
J - detected below method detection limit and above instrument detection limit

Table B-3: Summary of Groundwater Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	NASP Reference	11GI10		11GI12		11GI14		11GS05			11GS07	
					1993	2003	1993	2003	1993	2003	1993	1995	2003	1993	2003
Aluminum	200	13	13	3882.8	**745**	41 J	**1130**	570	**4070**	**680**	**409**	**310**	**490**	30 U	**230**
Antimony	6	4300	4300	30.2	21 U	3.8 U	21 U	3.8 U	21 U	3.8 U	**30** UJ	2.3 UJ	3.8 U	21 U	3.8 U
Arsenic	50	50	50	2.8	3 J	8.5 J	6 J	3.9 U	17	3.9 U	2 U	1.9 J	3.9 U	1 J	3.9 U
Barium	2000	NA	NA	13.2	37 J	17	18 J	42	23 J	14	46 J	43.5 J	49	716	150
Beryllium	4	0.13	0.13	1.1	1 U	0.1 U	1 U	0.1 U	1 U	0.1 U	1 U	0.08 U	0.1 U	1 U	0.1 U
Cadmium	5	9.3*	9.3	3.4	2 U	0.4 U	2 U	0.4 U	2 U	0.4 U	2 U	0.22 U	0.4 U	**7**	**33**
Calcium	NA	NA	NA	17560	37100	31000	151000	56000	10400	9000	5630	21300	11000	53000	17000
Chromium	100	NA	NA	35	3 U	0.9 U	3 U	1.4 J	9 J	1.5 J	3 U	2.7 U	3.5 J	3 U	26
Cobalt	150	NA	NA	4.1	4 U	0.87 J	4 U	0.7 U	4 U	0.7 U	4 U	0.77 J	1.4 J	4 U	1.7 J
Copper	1000	3.7*	2.9	16.2	3 U	0.8 U	3 U	1.2 J	3 J	1.1 J	4 U	2.5 U	2.2 J	8 U	120
Cyanide	200	5.2	1	NA	20 U	na	20 U	na	20 U	na	20 U	na	na	10 U	na
Iron	300	1000	300	1707.8	**442** J	**2400**	**471** J	**310**	**1200** J	**730**	**5060** J	**3490**	**1700**	**8440** J	**540**
Lead	15	8.5*	8.5	1.6	2 U	1.9 U	2 U	1.9 U	4 J	1.9 U	**30** J	13	9.7	6	**42**
Magnesium	NA	NA	NA	2872.6	14500 R	17000	120000 R	29000	1990 R	1300	1040 R	868	1400	9440 R	2400
Manganese	50	NA	NA	22	32	**120**	**52**	**130**	21 U	38	**95** J	36.2	45	**365**	40
Mercury	2	0.012	0.025	0.2	0.2 U	0.1 U	0.2 U	0.1 U	0.2 U	0.1 U	0.2 U	0.06 U	0.1 U	0.2 U	0.1 U
Nickel	100	8.3*	8.3	39.9	7 U	1.2 U	7 U	1.2 U	7 U	1.2 U	7 U	1.6 U	1.5 J	7 U	13 J
Potassium	NA	NA	NA	12167	5850	8300	30000	14000	1930 J	780 J	1110 U	2050	1100	3970 J	860 J
Selenium	50	5	71	3.9	2 U	4.3 U	2 U	4.3 U	2 U	4.3 U	2 U	2 UJ	4.3 U	2 U	4.3 U
Silver	100	0.07	0.4	4	4 UJ	1 U	4 UJ	1 U	4 UJ	1 U	4 U	1 U	1 U	4 U	1.4 J
Sodium	NA	NA	NA	18345	178000	180000	1160000	320000	38900	17000	8000	5470	8200	14500 U	6300
Thallium	2	6.3	6.3	3.6	2 U	6.6 U	10 U	6.6 U	2 U	6.6 U	2 UJ	0.95 U	6.6 U	2 U	6.6 U
Vanadium	53	NA	NA	9.6	4 U	1 U	6 J	2 J	30 J	2.6 J	4 U	2.6 U	3.2 J	4 U	1.4 J
Zinc	5000	86*	86	153.2	2 U	5.9 J	2 U	4.2 J	10 U	3.4 J	36 U	4.7 U	2.9 J	560	1600

Table B-3: Summary of Groundwater Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	NASP Reference	11GS09		11GS13		11GS15			11GS16	11GS28	
					1993	2003	1993	2003	1993	1995	2003	2003	1993	2003
Aluminum	200	13	13	3882.8	29 U	89 J	458	80 J	29 U	**1090**	18 J	170 J	**919**	62 J
Antimony	6	4300	4300	30.2	21 U	3.8 U	21 U	3.8 U	21 U	2.3 U	3.8 U	3.8 U	29 U	3.8 U
Arsenic	50	50	50	2.8	1 U	3.9 U	4 J	3.9 U	1 U	7.6 J	3.9 U	3.9 U	1 J	3.9 U
Barium	2000	NA	NA	13.2	382	410	**3790**	**3900**	20 J	72.1	50	28	20 J	16
Beryllium	4	0.13	0.13	1.1	1 U	0.1 U	1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	1 U	0.1 U
Cadmium	5	9.3*	9.3	3.4	2 U	0.42 J	2 U	0.4 U	4 J	0.3 U	**13**	2.6 J	2 U	0.4 U
Calcium	NA	NA	NA	17560	109000	110000	90400	97000	16200	46400 J	44000	27000	14500	20000
Chromium	100	NA	NA	35	3 U	2.5 J	3 U	0.9 U	3 U	5.4 U	3.4 J	4.1 J	3 U	0.9 U
Cobalt	150	NA	NA	4.1	4 U	0.7 U	4 U	0.92 J	4 U	0.74 J	0.7 U	0.7 U	4 U	0.7 U
Copper	1000	3.7*	2.9	16.2	7 U	3.2 J	4 J	2.7 J	3 U	4.4 U	2.1 J	13 J	3 J	0.8 U
Cyanide	200	5.2	1	NA	20 U	na	20 U	na	20 U	na	na	na	20 U	na
Iron	300	1000	300	1707.8	1440 UJ	**1900**	**10100** J	**8300**	38 U	**3500**	73	**1000**	**4120** J	**1800**
Lead	15	8.5*	8.5	1.6	4 J	7.7	**17**	1.9 U	3 J	1.9 U	1.9 U	13	2 J	2.8 J
Magnesium	NA	NA	NA	2872.6	10500 R	11000	15000 R	21000	1350 R	14200	3600	1200	4190 R	3200
Manganese	50	NA	NA	22	**212**	**230**	**133**	**140**	2 U	**106**	0.96 J	25	**83**	41
Mercury	2	0.012	0.025	0.2	0.2 U	0.1 U	0.2 U	0.1 U	0.2 U	0.06 U	0.1 U	0.1 U	0.2 U	0.1 U
Nickel	100	8.3*	8.3	39.9	7 U	1.2 U	7 U	1.4 J	7 U	4.3 U	1.2 U	1.2 U	11 U	1.2 U
Potassium	NA	NA	NA	12167	3530 U	4800	5760	10000	2100	12300	3700	280 J	1110 U	890 J
Selenium	50	5	71	3.9	2 U	4.3 U	2 U	4.4 J	2 U	2 U	4.3 U	4.3 U	2 U	4.3 U
Silver	100	0.07	0.4	4	4 U	1 U	4 UJ	1 U	4 UJ	1 UJ	1 U	1 U	4 UJ	1 U
Sodium	NA	NA	NA	18345	7900 U	20000	16900	28000	4320 J	169000	5100	3000	4870 J	3300
Thallium	2	6.3	6.3	3.6	2 U	6.6 U	2 U	6.6 U	2 U	0.95 U	6.6 U	6.6 U	2 U	6.6 U
Vanadium	53	NA	NA	9.6	4 U	1 J	4 U	1.4 J	4 U	12	1 U	1 U	8 J	1 U
Zinc	5000	86*	86	153.2	2 U	14 J	53	23	25 U	9 U	81	88	11 U	1.9 J

Table B-3: Summary of Groundwater Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	NASP Reference	11GS47			12GS08		12GS09		25GS01			27GI02	
					1993	1995	2003	1995	2003	1995	2003	1993	1995	2003	1993	2003
Aluminum	200	13	13	3882.8	120 U	62.8 U	44 J	117 J	190 J	90.5 J	25 J	**15800**	**248** J	87 J	**27600**	**290**
Antimony	6	4300	4300	30.2	21 U	2.3 U	3.8 U	1.9 U	3.8 U	1.9 U	4.4 U	35 U	2.3 U	3.8 U	35 U	3.8 U
Arsenic	50	50	50	2.8	1 U	1.5 UJ	3.9 U	3.2 U	3.9 U	3.2 U	3.9 U	4 U	1.5 U	3.9 U	23.1	3.9 U
Barium	2000	NA	NA	13.2	33 U	34.2	76	26.6 J	27	35.1 J	80	56.4	7.4 U	9.6 J	45.1	10
Beryllium	4	0.13	0.13	1.1	1 U	0.08 U	0.1 U	0.2 U	0.1 U	0.2 U	0.1 U	1 U	0.08 UJ	0.1 U	1 U	0.1 U
Cadmium	5	9.3*	9.3	3.4	2 U	0.38 U	0.4 U	**9.6**	**17**	3.8 J	**8.5**	4	0.22 U	0.4 U	3 U	0.4 U
Calcium	NA	NA	NA	17560	12200 U	15500	20000	38200	31000	40100	50000	24000	29700	41000	11300	11000
Chromium	100	NA	NA	35	3 U	1 U	1.5 J	0.9 U	0.9 U	0.9 U	1.8 J	18	0.64 U	0.9 U	47.3	3.9 J
Cobalt	150	NA	NA	4.1	4 U	0.67 U	0.73 U	0.6 U	0.7 J	0.77 J	2.9 J	9 U	0.67 U	0.7 U	9 U	0.7 U
Copper	1000	3.7*	2.9	16.2	3 U	2 U	0.8 U	6.8 J	2.3 J	1.5 U	0.8 U	20.4	0.64 U	0.96 J	9.2 U	2 J
Cyanide	200	5.2	1	NA	10 U	na	na	10 U	na	10 U	na	10 U	na	na	10 U	na
Iron	300	1000	300	1707.8	**2360** UJ	**1710**	**2100**	113	**2400**	16.4 J	**2700**	**10400** J	211	43 J	**12400**	**1900**
Lead	15	8.5*	8.5	1.6	1 J	0.81 U	1.9 U	4	6.4	1.9 U	1.9 U	6.4	1.4 U	1.9 U	**34.9**	1.9 U
Magnesium	NA	NA	NA	2872.6	1270 UR	1120	1400	2360 J	1400	2180 J	3500	2690	1480	2900	3220	1700
Manganese	50	NA	NA	22	35 U	29.6 U	**240**	4.7 J	1.4 J	37	21	**115**	1.8 U	0.5 U	**54.9**	9.1 J
Mercury	2	0.012	0.025	0.2	0.2 U	0.07 J	0.1 U	0.2 U	0.1 U	0.2 U	0.1 U	0.26	0.06 U	0.1 U	0.2 U	0.1 U
Nickel	100	8.3*	8.3	39.9	7 U	1.7 U	1.2 U	1.4 U	2.7 J	17.5 J	2.3 J	18 U	0.88 U	1.2 U	18 U	1.2 U
Potassium	NA	NA	NA	12167	1110 U	809 J	610 J	1320 J	1200	1270 J	2000	1730	1140	1300	2000	1700
Selenium	50	5	71	3.9	2 U	2 U	4.3 U	4.4 U	4.3 U	4.4 U	4.3 U	3 UJ	2 UJ	4.3 U	3 U	4.3 U
Silver	100	0.07	0.4	4	4 U	3.6 U	1 U	0.5 U	1 U	0.5 U	1 U	4 U	1 U	1 U	4 U	1 U
Sodium	NA	NA	NA	18345	3000 U	1910	2300	6400	13000	4420 J	5300	5170	3700	12000	12000	8300
Thallium	2	6.3	6.3	3.6	2 U	0.95 U	6.6 U	4.5 U	6.6 U	4.5 U	6.6 U	3 U	0.95 U	6.6 U	30 U	6.6 U
Vanadium	53	NA	NA	9.6	4 U	1.5 J	2 J	0.87 J	3 J	0.59 J	5.2 J	25.2	0.89 J	1 U	**64.1**	1 U
Zinc	5000	86*	86	153.2	7 U	6.4 U	4.1 J	164	540	62.1	560	603	68 J	120	85.3	6.2 J

Table B-3: Summary of Groundwater Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	NASP Reference	27GS01						27GS02						27GS10						30GI19			
					1993		1995		2003		1993		1995		2003		1993		1995		2003		1993		2003	
Aluminum	200	13	13	3882.8	**20400**	J	89.2	UJ	130	J	**4070**		14.4	UJ	**570**		**43200**	J	21.1	UJ	120	J	167	U	**420**	
Antimony	6	4300	4300	30.2	**61.1**	J	2.3	U	3.8	U	35	U	2.3	U	3.8	U	**61**	J	2.3	U	3.8	U	35	U	3.8	U
Arsenic	50	50	50	2.8	4.7	J	1.5	U	3.9	U	4	U	1.5	U	3.9	U	12.3	J	1.5	U	3.9	U	2	U	4.3	J
Barium	2000	NA	NA	13.2	46.7	J	12	U	7.4	J	52.9		4.7	U	13		68.8		3.9	U	4.3	J	29.9	U	31	
Beryllium	4	0.13	0.13	1.1	1	U	0.08	UJ	0.1	U	1	U	0.08	UJ	0.1	U	1	U	0.08	UJ	0.1	U	1	U	0.1	U
Cadmium	5	9.3*	9.3	3.4	3	U	0.22	U	0.4	U	3	U	0.22	U	0.4	U	**19.6**		4.7	U	**8**		3	U	0.4	U
Calcium	NA	NA	NA	17560	17500		23400		21000		16900		6630		22000		21400		14800		14000		12300		9400	
Chromium	100	NA	NA	35	15.1		0.64	U	0.9	U	8.8		0.64	U	1.6	J	**5810**		**309**		**160**		4	UJ	1.7	J
Cobalt	150	NA	NA	4.1	9	U	1.2	U	0.7	U	9	U	0.67	U	0.7	U	9.9		0.67	U	1.8	J	3	U	1	J
Copper	1000	3.7*	2.9	16.2	15.5		0.64	U	1.2	J	6.6	U	0.71	U	1.9	J	27.3		2.2	U	1.1	J	4	U	2	J
Cyanide	200	5.2	1	NA	13.9		na		na		10	U	na		na		10	U	na		na		10	U	na	
Iron	300	1000	300	1707.8	**11700**	J	**4470**		**730**		**1620**		17.9	U	240		**23300**	J	14.1	U	**3000**		**356**		**410**	
Lead	15	8.5*	8.5	1.6	4.3	J	0.81	U	1.9	U	**20.4**		0.81	U	1.9	U	**44.8**	J	0.81	U	1.9	U	2.2	J	1.9	U
Magnesium	NA	NA	NA	2872.6	5130		1450		1900		1600		786		1900		6100		2160		3400		4900	J	4900	
Manganese	50	NA	NA	22	46.1		**371**		5.7	J	44.5		34.6		7.5	J	**218**		**52.2**		**190**		**54.8**		47	
Mercury	2	0.012	0.025	0.2	0.2	U	0.06	U	0.1	U	0.2		0.06	U	0.1	U	0.2	U	0.06	U	0.1	U	0.2	U	0.1	U
Nickel	100	8.3*	8.3	39.9	19.6		0.76	U	1.2	U	18	U	0.74	U	1.2	U	31.1		1.4	U	4.6	J	15	U	2.8	J
Potassium	NA	NA	NA	12167	5160		3000		2500		3250		1110		2900		8780		4020		4900		2410	J	3700	
Selenium	50	5	71	3.9	30	UJ	2	UJ	4.3	U	3	U	2	UJ	4.3	U	30	UJ	2	UJ	4.3	U	2	U	4.3	U
Silver	100	0.07	0.4	4	4	U	1	U	1	U	4	U	1	U	1	U	4	U	1	U	1	U	4	UJ	1	U
Sodium	NA	NA	NA	18345	11100		8130		5400		6120		8140		7800		13100		9260		11000		10400		11000	
Thallium	2	6.3	6.3	3.6	3	UJ	0.95	U	6.6	U	3	U	0.95	U	6.6	U	3	UJ	0.95	U	6.6	U	2	U	6.6	U
Vanadium	53	NA	NA	9.6	33.2		1.2	J	2.1	J	6	U	0.76	U	1	U	**57.7**		0.76	U	1.5	J	3	U	1.4	J
Zinc	5000	86*	86	153.2	31.5		8.9	U	3.7	J	42.6	U	1.3	U	5	J	131		5.3	U	5.1	J	10.8	U	5.4	J

Table B-3: Summary of Groundwater Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	NASP Reference	30GI111		30GI126			30GS06			30GS18		30GS22		
					1992	2003	1993	1995	2003	1993	1995	2003	1993	2003	1993	1995	2003
Aluminum	200	13	13	3882.8	**724**	**270**	**5270** J	53.1 U	160 J	**977**	165 U	200 J	**2730**	**660**	68.4 J	52.9 U	50 J
Antimony	6	4300	4300	30.2	35 U	3.8 U	35 U	2.3 U	3.8 U	35 U	2.3 U	3.8 U	35 U	3.8 U	35 U	2.3 U	3.8 U
Arsenic	50	50	50	2.8	11.4	27	2 U	2.2 J	3.9 U	2 U	1.5 UJ	11	4.6 J	4.7 J	2 U	1.5 UJ	3.9 U
Barium	2000	NA	NA	13.2	79.8 U	110	23.7 U	18.8 U	20	16.6 U	18.7 U	51	8.9 U	9.7 J	6.2 U	13.4 U	24
Beryllium	4	0.13	0.13	1.1	1 U	0.1 U	1 U	0.08 U	0.1 U	1 U	0.08 U	0.1 U	1 U	0.1 U	1 U	0.08 U	0.1 U
Cadmium	5	9.3*	9.3	3.4	3 U	0.4 U	3 U	0.22 U	0.4 U	3 U	0.33 U	0.4 U	3 U	0.4 U	3 U	0.4 U	0.4 U
Calcium	NA	NA	NA	17560	62900	71000	10200	10000	10000	14900	9800	42000	9560	18000	5520	13700	40000
Chromium	100	NA	NA	35	5.8 U	1.1 J	11.8 U	0.64 U	0.9 U	4 U	0.74 U	4.9 J	20.9 J	17	4 U	2 U	13
Cobalt	150	NA	NA	4.1	3 U	1.4 J	3 U	0.76 J	0.7 U	3 U	0.67 U	1.3 J	3 U	0.76 J	3 U	0.67 U	0.7 U
Copper	1000	3.7*	2.9	16.2	9.1 U	2 J	8.6 U	3.3 U	0.8 U	7.4 U	1.6 U	3.1 J	5.9 U	2.3 J	4.2 U	2.4 U	0.8 U
Cyanide	200	5.2	1	NA	10 UJ	na	10 U	na	na	10 UJ	na	na	10 U	na	10 U	na	na
Iron	300	1000	300	1707.8	**15800**	**30000**	**2070**	**674**	**750**	**4230**	234	**6300**	**5260**	**4000**	137 UJ	125	**500**
Lead	15	8.5*	8.5	1.6	2 U	1.9 U	2 U	0.81 U	1.9 U	**34.8** J	3.4	**130**	2.6 J	1.9 U	**52.5** J	**56.2**	13
Magnesium	NA	NA	NA	2872.6	36900	53000	2800 J	2880	3300	1510 J	4390	5400	1970 J	2300	996 J	1190	2300
Manganese	50	NA	NA	22	**76.8**	**95**	23	24.1 U	26	41.5	21.5 U	**65**	**60.9**	**77**	2.5 U	5.9 U	44
Mercury	2	0.012	0.025	0.2	0.2 U	0.1 U	0.2 U	0.06 U	0.1 U	0.2 U	0.06 J	0.1 U	0.2 U	0.1 U	0.2 U	0.09 J	0.1 U
Nickel	100	8.3*	8.3	39.9	15 U	1.2 U	15 U	2.5 U	1.2 U	15 U	1.4 U	1.2 U	25.1 U	8.5 J	15 U	1.2 U	1.2 U
Potassium	NA	NA	NA	12167	12900	24000	1360 J	1250	1700	2950 J	5580	6400	1060 J	940 J	906 J	2600	13000
Selenium	50	5	71	3.9	3.4 U	4.3 U	2 U	3.7 U	4.3 U	2.7 U	2 U	4.3 U	2 U	4.3 U	2 U	2 U	4.3 U
Silver	100	0.07	0.4	4	4 U	1 U	4 U	1 U	1 U	4 U	1 U	1 U	4 U	1 U	4 U	1 U	1 U
Sodium	NA	NA	NA	18345	344000	550000	9620	9700	10000	7790	9710	14000	5640	11000	29100	10300	8700
Thallium	2	6.3	6.3	3.6	10 U	6.6 U	2 U	0.95 U	6.6 U	2 U	0.95 U	6.6 U	2 U	6.6 U	2 UJ	0.95 U	6.6 U
Vanadium	53	NA	NA	9.6	3 U	1.4 J	14.3 U	0.76 UJ	1 U	3 U	0.76 UJ	2.6 J	5.2 U	1.1 J	3 U	0.76 UJ	1.1 J
Zinc	5000	86*	86	153.2	22.8 U	6.3 J	37 U	6 U	4.5 J	18.8 U	4.1 U	5.3 J	11.9 U	5.5 J	5 U	20.4	4.1 J

Table B-3: Summary of Groundwater Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	NASP Reference	30GS27			30GS28			30GS103			30GS111		
					1993	1995	2003	1993	1995	2003	1993	1995	2003	1993	1995	2003
Aluminum	200	13	13	3882.8	**235** J	**327** J	**590**	20 UJ	**784** J	**520**	38.6 U	52.9 U	96 J	**760**	**339**	160 J
Antimony	6	4300	4300	30.2	35 U	2.3 U	3.8 U	35 U	2.3 U	3.8 U	35 U	**7.8** J	3.8 U	35 U	2.3 U	3.8 U
Arsenic	50	50	50	2.8	2 J	1.5 U	3.9 U	2 U	1.5 U	3.9 U	3 J	1.5 J	3.9 U	2 U	1.5 UJ	3.9 U
Barium	2000	NA	NA	13.2	6.2 U	8 U	8.5 J	6.2 U	6.1 UJ	4.4 J	458	328	260	5.2 U	6 U	20
Beryllium	4	0.13	0.13	1.1	1 U	0.08 UJ	0.1 U	1 U	0.08 U	0.1 U	1 U	0.08 U	0.1 U	1 U	0.27 U	0.1 U
Cadmium	5	9.3*	9.3	3.4	3.4 J	0.89 U	0.74 J	**7.8**	**108**	**120**	3 U	**5.1** J	1.8 J	3 U	0.59 J	0.4 U
Calcium	NA	NA	NA	17560	11100	12600	9800	21300	16200	19000	198000	188000 J	170000	9600	9890	46000
Chromium	100	NA	NA	35	**1380**	69.9	**180**	**715**	**418**	**250**	4 U	1.5 U	7.1 J	5.7 U	3 U	1.7 J
Cobalt	150	NA	NA	4.1	3 U	0.69 U	0.7 U	3 U	0.67 U	1.4 J	3 U	0.67 U	0.8 U	3 U	0.67 U	0.7 U
Copper	1000	3.7*	2.9	16.2	7.2 U	9.4 U	1.7 J	12 U	73	11 J	7.2 U	5.6 U	9.2 U	6.6 U	2.2 U	1 J
Cyanide	200	5.2	1	NA	10 U	na	na	10 U	na	na	10 UJ	na	na	10 UJ	na	na
Iron	300	1000	300	1707.8	241 UJ	**2810**	**1900**	22.6 UJ	**6970**	**2700**	**7900**	**4680**	**2700**	**1320**	**605**	**1200**
Lead	15	8.5*	8.5	1.6	5 J	4 U	3.1 J	2 UJ	4.1 U	1.9 U	10.2 J	**37.1**	**73**	4.7 J	1.8 J	1.9 U
Magnesium	NA	NA	NA	2872.6	2110 J	1010	1200	2620 J	1000	2700	17900	15000	12000	2700 J	1620	4500
Manganese	50	NA	NA	22	31.2 U	23.2	32	**53**	19.6	**52**	**457**	**204**	**110**	31	15.9 J	**110**
Mercury	2	0.012	0.025	0.2	0.2 U	0.06 U	0.1 U	0.2 U	0.09 U	0.1 U	0.2 U	0.06 U	0.1 U	0.2 U	0.06 U	0.1 U
Nickel	100	8.3*	8.3	39.9	15 U	0.99 U	1.2 U	15 U	1.5 U	2 J	15 U	1.5 U	2.4 J	15 U	0.74 U	1.2 U
Potassium	NA	NA	NA	12167	4690 J	2890	3200	6240	1660	4300	8460	7410	7500	10400	6910	7800
Selenium	50	5	71	3.9	2 U	2 UJ	4.3 U	2 UJ	2 UJ	4.3 U	2.6 U	2 U	4.3 U	2 U	2 U	4.3 U
Silver	100	0.07	0.4	4	4 U	1 U	1 U	4 U	1 U	1 U	4 U	1 UJ	1 U	4 U	1 U	1 U
Sodium	NA	NA	NA	18345	8050	8160	5300	9840	4040	8800	9340	6790	7100	37300	11500	12000
Thallium	2	6.3	6.3	3.6	2 UJ	0.95 U	6.6 U	2 UJ	0.95 U	6.6 U	2 U	0.95 U	6.6 U	2 U	0.95 U	6.6 U
Vanadium	53	NA	NA	9.6	3 U	1.2 J	1.6 J	3 U	8.7 J	3.1 J	3 U	0.79 J	2.2 J	3 U	2.9 U	1.4 J
Zinc	5000	86*	86	153.2	10.7 U	7.7 U	3.1 J	5 U	5.8 U	4.2 J	20.5 U	23 U	16 J	13.8 U	4.9 U	4.2 J

Table B-3: Summary of Groundwater Metals
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	NASP Reference	30GS123		30GS126			30GS170		30GS029 (30GS174)	
					1993	2003	1993	1995	2003	1993	2003	1993	2003
Aluminum	200	13	13	3882.8	681	120 J	**627** J	**579**	**630**	**948**	**240**	126 UJ	86 J
Antimony	6	4300	4300	30.2	35 U	3.8 U	35 U	2.3 U	3.8 U	35 U	3.8 U	35 U	3.8 U
Arsenic	50	50	50	2.8	2 U	3.9 U	2 U	1.5 UJ	3.9 U	2 U	3.9 U	2 U	3.9 U
Barium	2000	NA	NA	13.2	7.3 U	6.2 J	6.4 U	14.8 U	6.8 J	10.1 U	17	14.2 U	9.1 J
Beryllium	4	0.13	0.13	1.1	1 U	0.1 U	1 U	0.08 U	0.1 U	1 U	0.1 U	1 U	0.1 U
Cadmium	5	9.3*	9.3	3.4	3 U	1.1 J	3 U	**21.8**	0.45 J	3 U	3.2 J	14.2 U	**14**
Calcium	NA	NA	NA	17560	9410	14000	17000	13500	5100	23400	32000	12200	18000
Chromium	100	NA	NA	35	7.4 U	1.7 J	11.7 U	4.9 U	10	12.2 U	21	4.3 U	6.2 J
Cobalt	150	NA	NA	4.1	3 U	0.7 U	3 U	1 J	0.7 U	3 U	1.5 J	3 U	0.7 U
Copper	1000	3.7*	2.9	16.2	6.4 U	0.8 U	20.5 U	1.8 U	0.8 U	6.4 U	1.5 U	7.1 U	2.2 J
Cyanide	200	5.2	1	NA	10 UJ	na	10 U	na	na	10 UJ	na	10 U	na
Iron	300	1000	300	1707.8	**702**	**350**	249	**510**	**3400**	**382**	220	1100	41 J
Lead	15	8.5*	8.5	1.6	3.2 J	1.9 U	4.2	**236**	**37**	5 J	1.9 U	3.6	1.9 U
Magnesium	NA	NA	NA	2872.6	2330 J	3400	2320 J	2620	2000	2150 J	1900	2980 J	1500
Manganese	50	NA	NA	22	24.3	17	24.4	35.1	31	21.4	**100**	**57.8**	1.2 J
Mercury	2	0.012	0.025	0.2	0.2 U	0.1 U	0.2 U	0.06 J	0.1 U	0.2 U	0.1 U	0.2 U	0.1 U
Nickel	100	8.3*	8.3	39.9	15 U	1.2 U	15 U	17.1 U	1.2 U	15 U	1.2 U	15 U	1.2 U
Potassium	NA	NA	NA	12167	1140 J	2900	1270 J	776 J	1500	1740 J	1900	4020 J	4100
Selenium	50	5	71	3.9	2.8 U	4.3 U	2 U	2 U	4.3 U	3.6 U	4.3 U	2 U	4.3 U
Silver	100	0.07	0.4	4	4 U	1 U	4.9 U	1 U	1 U	4 U	1 U	4 U	1 U
Sodium	NA	NA	NA	18345	7420	12000	6140	9380	11000	8880	12000	8890	7300
Thallium	2	6.3	6.3	3.6	2 U	6.6 U	2 U	0.95 U	6.6 U	2 U	6.6 U	2 U	6.6 U
Vanadium	53	NA	NA	9.6	3 U	1 U	3 U	0.76 UJ	4.9 J	3 U	1.4 J	3 U	1 U
Zinc	5000	86*	86	153.2	22.3 U	9 J	43.1 U	45.8	2.6 J	15.4 U	1.8 U	16.3 U	3.7 J

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SI00602	011SI01501	011SRA0101	011SRA0201	011SRA0301	011SRA0401	011SRA0501	011SRA0601	011SRA0701	011SRA0801
4,4'-DDD	18	4.6	0.0033 U	0.0034 U	0.0045 J	0.0034 U	0.0034 U	0.0033 U	0.01 U	0.03 U	0.035 DJ	0.0095 J
4,4'-DDE	13	3.3	0.0033 U	0.0034 U	0.015	0.0034 U	0.0034 U	0.0033 U	0.029 J	0.042 J	0.19 DJ	0.051 D
4,4'-DDT	13	3.3	0.0033 U	0.0034 U	0.024	0.0034 U	0.0034 U	0.0033 U	0.01 U	0.1 DU	0.34 DJ	0.07 D
Aldrin	0.3	0.07	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0018 U
alpha-BHC	0.5	0.2	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0018 U
alpha-Chlordane	12	3.1	0.0017 U	0.0018 U	0.0046	0.0017 U	0.0017 U	0.0017 U	0.0038	0.0019 U	0.0019 U	0.0018 U
Aroclor-1016	2.1	0.5	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	0.033 U	0.04 U	0.037 U	0.036 U	0.035 U
Aroclor-1221	2.1	0.5	0.067 U	0.069 U	0.068 U	0.068 U	0.069 U	0.068 U	0.081 U	0.075 U	0.073 U	0.072 U
Aroclor-1232	2.1	0.5	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	0.033 U	0.04 U	0.037 U	0.036 U	0.035 U
Aroclor-1242	2.1	0.5	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	0.033 U	0.04 U	0.037 U	0.036 U	0.035 U
Aroclor-1248	2.1	0.5	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	0.033 U	0.04 U	0.037 U	0.036 U	0.035 U
Aroclor-1254	2.1	0.5	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	0.033 U	0.04 U	0.037 U	0.036 U	0.035 U
Aroclor-1260	2.1	0.5	0.033 U	0.034 U	0.034 U	0.034 U	0.048	0.033 U	0.35	**1.4 D**	0.036 U	0.23
beta-BHC	2.1	0.6	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0018 U
delta-BHC	420	22	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0018 U
Dieldrin	0.3	0.07	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.022	0.0037 U	0.0036 U	0.0035 U
Endosulfan I	6700	410	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.002 U	0.0019 U	0.003 DU	0.0018 U
Endosulfan II	6700	410	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.004 U	0.0037 U	0.008 DJ	0.0035 U
Endosulfan sulfate	6700	410	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.004 U	0.0037 U	0.0036 U	0.0044 J
Endrin	340	21	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.004 U	0.0037 U	0.0043 J	0.0035 U
Endrin aldehyde	340	21	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.004 U	0.0037 U	0.0036 U	0.0035 U
Endrin ketone	340	21	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.004 U	0.0037 U	0.0036 U	0.0035 U
(Lindane)	2.2	0.7	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0018 U
gamma-Chlordane	12	3.1	0.0017 U	0.0018 U	0.0044	0.0017 U	0.0017 U	0.0017 U	0.0042 J	0.0019 U	0.0019 U	0.0018 U
Heptachlor	0.9	0.2	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0018 U
Methoxychlor	7500	370	0.017 U	0.018 U	0.017 U	0.017 U	0.017 U	0.017 U	0.02 U	0.019 U	0.019 U	0.018 U
Toxaphene	3.7	1	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U	0.19 U	0.19 U	0.18 U

Notes:
All concentrations expressed in milligrams per kilogram
* Indicates the value exceeds the C/I direct exposure SCTL.
Bold indicates the value exceeds the residential direct exposure SCTL.
Blank cells indicate that the sample was not collected or analyzed for that parameter
na - not analyzed
U - not detected
J - present below the method detection limit but above the instrument detection limit
Aroclors were compared with the PCB aroclor mixture SCTL
Alpha- and gamma-chlordane were compared with the Chlordane SCTL
Endosulfan I, Endosulfan II, and Endosulfan sulfate were compared with the Endosulfan SCTL
Endrin aldehyde and Endrin ketone were compared with the Endrin SCTL

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SRA0901	011SRA1001	011SRA1101	011SRA1201	011SRA1301	011SS00101	011SS00301	011SS01101	011SS01301	012S000201
4,4'-DDD	18	4.6	0.0036 U	0.0034 U	0.0034 U	0.0066	0.0035 U	0.0034 U	0.0035 U	0.0036 U	0.0037 U	0.0035 U
4,4'-DDE	13	3.3	0.0036 U	0.0034 U	0.0034 U	0.0035 U	0.014 J	0.016	0.0035 U	0.0047	0.0037 U	0.009
4,4'-DDT	13	3.3	0.0037	0.0034 U	0.0034 U	0.0035 U	0.02 J	0.016 U	0.0045 J	0.0086	0.0037 U	0.025
Aldrin	0.3	0.07	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.0018 U
alpha-BHC	0.5	0.2	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.0018 U
alpha-Chlordane	12	3.1	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.0062
Aroclor-1016	2.1	0.5	0.036 U	0.034 U	0.034 U	0.035 U	0.035 U	0.034 U	0.035 U	0.036 U	0.037 U	0.035 U
Aroclor-1221	2.1	0.5	0.072 U	0.068 U	0.069 U	0.071 U	0.072 U	0.069 U	0.072 U	0.073 U	0.076 U	0.071 U
Aroclor-1232	2.1	0.5	0.036 U	0.034 U	0.034 U	0.035 U	0.035 U	0.034 U	0.035 U	0.036 U	0.037 U	0.035 U
Aroclor-1242	2.1	0.5	0.036 U	0.034 U	0.034 U	0.035 U	0.035 U	0.034 U	0.035 U	0.036 U	0.037 U	0.035 U
Aroclor-1248	2.1	0.5	0.036 U	0.034 U	0.034 U	0.035 U	0.035 U	0.034 U	0.035 U	0.036 U	0.037 U	0.035 U
Aroclor-1254	2.1	0.5	0.036 U	0.034 U	0.034 U	0.035 U	0.035 U	0.22	0.035 U	0.036 U	0.037 U	0.035 U
Aroclor-1260	2.1	0.5	0.036 U	0.034 U	0.034 U	0.035 U	0.099 J	0.034 U	0.043	0.036 U	0.037 U	0.36
beta-BHC	2.1	0.6	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.0018 U
delta-BHC	420	22	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.0018 U
Dieldrin	0.3	0.07	0.0036 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0065	0.0035 U	0.0036 U	0.0037 U	0.0096
Endosulfan I	6700	410	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.0018 U
Endosulfan II	6700	410	0.0036 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0034 U	0.0035 U	0.0036 U	0.0037 U	0.0035 U
Endosulfan sulfate	6700	410	0.0036 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0034 U	0.0035 U	0.0036 U	0.0037 U	0.0035 U
Endrin	340	21	0.0036 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0034 U	0.0035 U	0.0036 U	0.0037 U	0.0035 U
Endrin aldehyde	340	21	0.0036 U	0.0034 U	0.0034 U	0.005 U	0.0035 U	0.0034 U	0.0035 U	0.0036 U	0.0037 U	0.017
Endrin ketone	340	21	0.0036 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0034 U	0.0035 U	0.0036 U	0.0037 U	0.0035 U
(Lindane)	2.2	0.7	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.0018 U
gamma-Chlordane	12	3.1	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.002 J	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.011
Heptachlor	0.9	0.2	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0019 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 J	0.0018 U	0.0019 U	0.0019 U	0.0018 U
Methoxychlor	7500	370	0.018 U	0.017 U	0.017 U	0.018 U	0.018 U	0.018 U	0.018 U	0.019 U	0.019 U	0.018 U
Toxaphene	3.7	1	0.18 U	0.17 U	0.17 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	012S000301	012S000401	012S000501	012S000601	012S000701	012S000801	012S000901	012S001001	012S001101	012S001201
4,4'-DDD	18	4.6	0.0035 U	0.0035 U	0.0034 U	0.067 U	0.025 J	0.017 U	0.017 U	0.0035 U	0.033	0.0035 U
4,4'-DDE	13	3.3	0.038	0.02	0.0072 J	0.028 J	0.12 J	0.017 U	0.017 J	0.0059 P	0.035	0.0047
4,4'-DDT	13	3.3	0.055	0.018	0.0034 U	0.057 J	0.18 U	0.017 U	0.017 U	0.0035 U	0.0025 J	0.00031 J
Aldrin	0.3	0.07	0.0018 U	0.0018 U	0.0018 U	0.035 U	0.09 U	0.0088 U	0.009 U	0.00013 JP	0.0019 U	0.0018 U
alpha-BHC	0.5	0.2	0.0018 U	0.0018 U	0.0018 U	0.035 U	0.09 U	0.0088 U	0.009 U	0.0018 U	0.0019 U	0.0018 U
alpha-Chlordane	12	3.1	0.011	0.06 J	0.0048 J	0.14 J	0.09 U	0.0088 U	0.0078 J	0.0018 U	0.0019 U	0.00011 J
Aroclor-1016	2.1	0.5	0.035 U	0.035 U	0.034 U	0.67 U	1.8 U	0.17 U	0.17 U	0.035 U	0.037 U	0.035 U
Aroclor-1221	2.1	0.5	0.071 U	0.071 U	0.069 U	1.4 U	3.6 U	0.35 U	0.36 U	0.072 U	0.075 U	0.071 U
Aroclor-1232	2.1	0.5	0.035 U	0.035 U	0.034 U	0.67 U	1.8 U	0.17 U	0.17 U	0.035 U	0.037 U	0.035 U
Aroclor-1242	2.1	0.5	0.035 U	0.035 U	0.034 U	0.67 U	1.8 U	0.17 U	0.17 U	0.035 U	0.037 U	0.035 U
Aroclor-1248	2.1	0.5	0.035 U	0.035 U	0.034 U	0.67 U	1.8 U	0.17 U	0.17 U	0.035 U	0.037 U	0.035 U
Aroclor-1254	2.1	0.5	0.035 U	0.035 U	0.034 U	0.67 U	1.8 U	0.17 U	0.17 U	0.035 U	0.037 U	0.035 U
Aroclor-1260	2.1	0.5	**1.2**	*** 4.1**	0.41 J	**0.96**	*** 15**	***12**	*** 3.9**	0.39 Y	0.038 J	0.026 J
beta-BHC	2.1	0.6	0.0018 U	0.0018 U	0.0018 U	0.035 U	0.09 U	0.0088 U	0.009 U	0.0018 U	0.0019 U	0.0018 U
delta-BHC	420	22	0.0018 U	0.0018 U	0.0018 U	0.035 U	0.09 U	0.0088 U	0.009 U	0.00014 JP	0.0019 U	0.0018 U
Dieldrin	0.3	0.07	0.02	0.0046	0.0021 J	0.0054 J	0.018 J	0.017 U	0.017 U	0.0035 U	0.0037 U	0.00024 J
Endosulfan I	6700	410	0.0018 U	0.0018 U	0.0018 U	0.035 U	0.09 U	0.0088 U	0.009 U	0.0018 U	0.0019 U	0.0018 U
Endosulfan II	6700	410	0.0035 U	0.0035 U	0.0034 U	0.067 U	0.18 U	0.017 U	0.017 U	0.0035 U	0.0037 U	0.0035 U
Endosulfan sulfate	6700	410	0.00059 J	0.0035 U	0.0021 J	0.067 U	0.18 U	0.017 U	0.017 U	0.0035 U	0.0037 U	0.00098 J
Endrin	340	21	0.0035 U	0.0035 U	0.0034 U	0.067 U	0.18 U	0.017 U	0.017 U	0.0035 U	0.0037 U	0.0035 U
Endrin aldehyde	340	21	0.042	0.14 J	0.0034 U	0.028 J	0.18 U	0.017 U	0.017 U	0.02 P	0.0044	0.00071 J
Endrin ketone	340	21	0.0035 U	0.0035 U	0.0034 U	0.067 U	0.18 U	0.017 U	0.017 U	0.0035 U	0.0037 U	0.0035 U
(Lindane)	2.2	0.7	0.0018 U	0.0018 U	0.0018 U	0.035 U	0.09 U	0.0088 U	0.009 U	0.0018 U	0.0019 U	0.0018 U
gamma-Chlordane	12	3.1	0.015	0.061 J	0.0062 J	0.13 J	0.0073 J	0.0088 U	0.012 J	0.0021 P	0.000096 J	0.0018 U
Heptachlor	0.9	0.2	0.0018 U	0.0013 J	0.0018 U	0.012 J	0.09 U	0.0088 U	0.009 U	0.0018 U	0.0019 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0018 U	0.0018 U	0.0018 J	0.09 U	0.0088 U	0.009 U	0.0018 U	0.0019 U	0.0018 U
Methoxychlor	7500	370	0.018 U	0.0052 J	0.018 U	0.35 U	0.9 U	0.088 U	0.09 U	0.07 P	0.019 U	0.0013 J
Toxaphene	3.7	1	0.18 U	0.18 U	0.18 U	3.5 U	9 U	0.88 U	0.9 U	0.18 U	0.19 U	0.18 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	012S001301	012S001401	012S001501	012S001601	025S000100	025S000101	025S000202	025S000301	025S000302	025S000402
4,4'-DDD	18	4.6	0.0036 U	0.0036 U	0.0035 U	0.0035 U	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0035 U
4,4'-DDE	13	3.3	0.0036 U	0.00053 J	0.0035 U	0.0032 J	0.0012 J	0.0017 J	0.0034 U	0.0034 U	0.0034 U	0.0035 U
4,4'-DDT	13	3.3	0.0036 U	0.0036 U	0.0035 U	0.0015 J	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.00021 J
Aldrin	0.3	0.07	0.0018 U	0.0019 U	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
alpha-BHC	0.5	0.2	0.0018 U	0.0019 U	0.0018 U	0.0001 J	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
alpha-Chlordane	12	3.1	0.0018 U	0.0019 U	0.0013 J	0.0018 J	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
Aroclor-1016	2.1	0.5	0.036 U	0.036 U	0.035 U	0.035 U	0.033 U	0.033 U	0.034 U	0.034 U	0.034 U	0.035 U
Aroclor-1221	2.1	0.5	0.073 U	0.073 U	0.072 U	0.071 U	0.067 U	0.067 U	0.068 U	0.069 U	0.069 U	0.071 U
Aroclor-1232	2.1	0.5	0.036 U	0.036 U	0.035 U	0.035 U	0.033 U	0.033 U	0.034 U	0.034 U	0.034 U	0.035 U
Aroclor-1242	2.1	0.5	0.036 U	0.036 U	0.035 U	0.035 U	0.033 U	0.033 U	0.034 U	0.034 U	0.034 U	0.035 U
Aroclor-1248	2.1	0.5	0.036 U	0.036 U	0.035 U	0.035 U	0.033 U	0.033 U	0.034 U	0.034 U	0.034 U	0.035 U
Aroclor-1254	2.1	0.5	0.036 U	0.036 U	0.035 U	0.28	0.033 U	0.033 U	0.034 U	0.034 U	0.034 U	0.035 U
Aroclor-1260	2.1	0.5	**1.4**	0.062	**1.3**	0.15 J	0.1 J	0.12	0.034 U	0.034 U	0.034 U	0.035 U
beta-BHC	2.1	0.6	0.0018 U	0.0019 U	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
delta-BHC	420	22	0.0018 U	0.0019 U	0.0018 U	0.0018 U	0.000077 J	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
Dieldrin	0.3	0.07	0.0036 U	0.00056 J	0.0035 U	0.0035 U	0.0017 J	0.0012 J	0.0034 U	0.0034 U	0.0034 U	0.0035 U
Endosulfan I	6700	410	0.0018 U	0.0019 U	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
Endosulfan II	6700	410	0.0036 U	0.0036 U	0.0035 U	0.0035 U	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0035 U
Endosulfan sulfate	6700	410	0.0036 U	0.0036 U	0.0035 U	0.0008 J	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0035 U
Endrin	340	21	0.0036 U	0.0036 U	0.0035 U	0.0035 U	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0035 U
Endrin aldehyde	340	21	0.0036 U	0.0029 J	0.0035 U	0.008 J	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0035 U
Endrin ketone	340	21	0.0036 U	0.0036 U	0.0035 U	0.0035 U	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0035 U
(Lindane)	2.2	0.7	0.0018 U	0.0019 U	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
gamma-Chlordane	12	3.1	0.0018 U	0.0019 U	0.0013 J	0.00036 J	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
Heptachlor	0.9	0.2	0.0018 U	0.0019 U	0.0018 U	0.0018 U	0.0017 U	0.000068 J	0.0017 U	0.0017 U	0.0018 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0019 U	0.00018 J	0.0018 U	0.00032 J	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
Methoxychlor	7500	370	0.018 U	0.0036 U	0.018 U	0.0046 U	0.017 U	0.017 U	0.017 U	0.0011 J	0.018 U	0.018 U
Toxaphene	3.7	1	0.18 U	0.19 U	0.18 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.18 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S000502	025S000702	025S000900	025S000902	025S001002	025S001101	025S001102	025S001202	025S001302	025S001500
4,4'-DDD	18	4.6	0.0035 U	0.0034 U	0.00075 J	0.0034 U	0.00015 J	0.00025 J	0.0035 U	0.0036 U	0.0038 U	0.02 U
4,4'-DDE	13	3.3	0.0018 J	0.00021 J	0.00053 J	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.00016 J	0.02 U
4,4'-DDT	13	3.3	0.0001 J	0.0034 U	0.0036 U	0.0034 U	0.0035 U	0.00022 J	0.0035 U	0.0036 U	0.00079 J	0.02 U
Aldrin	0.3	0.07	0.0018 U	0.000092 J	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.01 U
alpha-BHC	0.5	0.2	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.00028 J
alpha-Chlordane	12	3.1	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0024 J
Aroclor-1016	2.1	0.5	0.035 U	0.034 U	0.036 U	0.034 U	0.035 U	0.035 U	0.035 U	0.036 U	0.038 U	0.2 U
Aroclor-1221	2.1	0.5	0.071 U	0.07 U	0.073 U	0.069 U	0.07 U	0.071 U	0.072 U	0.072 U	0.076 U	0.4 U
Aroclor-1232	2.1	0.5	0.035 U	0.034 U	0.036 U	0.034 U	0.035 U	0.035 U	0.035 U	0.036 U	0.038 U	0.2 U
Aroclor-1242	2.1	0.5	0.035 U	0.034 U	0.036 U	0.034 U	0.035 U	0.035 U	0.035 U	0.036 U	0.038 U	0.2 U
Aroclor-1248	2.1	0.5	0.035 U	0.034 U	0.036 U	0.034 U	0.035 U	0.035 U	0.035 U	0.036 U	0.038 U	0.2 U
Aroclor-1254	2.1	0.5	0.035 U	0.034 U	0.036 U	0.034 U	0.035 U	0.035 U	0.035 U	0.036 U	0.038 U	0.2 U
Aroclor-1260	2.1	0.5	0.0018 J	0.034 U	0.036 U	0.034 U	0.035 U	0.035 U	0.035 U	0.036 U	0.038 U	**1.1**
beta-BHC	2.1	0.6	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.01 U
delta-BHC	420	22	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0033 J
Dieldrin	0.3	0.07	0.00029 J	0.0034 U	0.0036 U	0.0034 U	0.000094 J	0.0003 J	0.00014 J	0.0036 U	0.0038 U	0.02 U
Endosulfan I	6700	410	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.01 U
Endosulfan II	6700	410	0.0035 U	0.0034 U	0.0036 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0038 U	0.02 U
Endosulfan sulfate	6700	410	0.00015 J	0.0034 U	0.0036 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0038 U	0.02 U
Endrin	340	21	0.0035 U	0.0034 U	0.0036 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0038 U	0.02 U
Endrin aldehyde	340	21	0.0035 U	0.0034 U	0.0036 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0038 U	0.02 U
Endrin ketone	340	21	0.0035 U	0.0034 U	0.0036 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0038 U	0.02 U
(Lindane)	2.2	0.7	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.01 U
gamma-Chlordane	12	3.1	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.01 U
Heptachlor	0.9	0.2	0.000077 J	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.00011 J	0.000095 J	0.0019 U	0.00058 J
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.00034 J
Methoxychlor	7500	370	0.00027 J	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.019 U	0.1 U
Toxaphene	3.7	1	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	1 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S001600	025S001601	025S001602	025S001700	025S001701	025S001702	025S001800	025S001900	025S001901	025S001902
4,4'-DDD	18	4.6	0.013 J	0.018 U	0.0034 U	0.0019 J	0.0035 U	0.00023 J	0.019 U	0.0035 U	0.001 J	0.0036 U
4,4'-DDE	13	3.3	0.076	0.021 J	0.0061	0.0048 U	0.00033 J	0.00064 J	0.0025 J	0.00048 J	0.00016 J	0.00066 J
4,4'-DDT	13	3.3	0.04 U	0.018 U	0.0034 U	0.0048 U	0.0044	0.0034 U	0.019 U	0.0035 U	0.0019 J	0.0036 U
Aldrin	0.3	0.07	0.0081 J	0.009 U	0.0018 U	0.001 J	0.0018 U	0.0018 U	0.0096 U	0.0018 U	0.0017 U	0.0019 U
alpha-BHC	0.5	0.2	0.021 U	0.009 U	0.0018 U	0.000093 J	0.0018 U	0.0018 U	0.0096 U	0.0018 U	0.0017 U	0.0019 U
alpha-Chlordane	12	3.1	0.021 U	0.009 U	0.0018 U	0.0025 U	0.0018 U	0.0018 U	0.0096 U	0.0018 U	0.00029 J	0.0019 U
Aroclor-1016	2.1	0.5	0.4 U	0.18 U	0.034 U	0.048 U	0.035 U	0.034 U	0.19 U	0.035 U	0.034 U	0.036 U
Aroclor-1221	2.1	0.5	0.82 U	0.36 U	0.069 U	0.097 U	0.071 U	0.07 U	0.38 U	0.072 U	0.069 U	0.073 U
Aroclor-1232	2.1	0.5	0.4 U	0.18 U	0.034 U	0.048 U	0.035 U	0.034 U	0.19 U	0.035 U	0.034 U	0.036 U
Aroclor-1242	2.1	0.5	0.4 U	0.18 U	0.034 U	0.048 U	0.035 U	0.034 U	0.19 U	0.035 U	0.034 U	0.036 U
Aroclor-1248	2.1	0.5	0.4 U	0.18 U	0.034 U	0.048 U	0.035 U	0.034 U	0.19 U	0.035 U	0.034 U	0.036 U
Aroclor-1254	2.1	0.5	0.4 U	0.18 U	0.079	**0.91**	0.078	0.034 U	0.28 J	0.046	0.034 U	0.059
Aroclor-1260	2.1	0.5	*** 31**	*** 5.7**	0.34	**0.98**	0.36	0.06	**0.78**	0.19	0.11	**0.53**
beta-BHC	2.1	0.6	0.021 U	0.009 U	0.0018 U	0.0025 U	0.0018 U	0.0018 U	0.0096 U	0.0018 U	0.0017 U	0.0019 U
delta-BHC	420	22	0.021 U	0.009 U	0.0018 U	0.0025 U	0.0018 U	0.0018 U	0.0072 J	0.0018 U	0.0017 U	0.0019 U
Dieldrin	0.3	0.07	**0.071**	0.054 J	0.027	0.0045 J	0.0043 J	0.00046 J	0.0038 J	0.013	0.0034 U	0.0068
Endosulfan I	6700	410	0.0027 J	0.009 U	0.0018 U	0.0025 U	0.0018 U	0.0018 U	0.00088 J	0.0018 U	0.0017 U	0.0019 U
Endosulfan II	6700	410	0.04 U	0.018 U	0.0034 U	0.0048 U	0.0035 U	0.0034 U	0.019 U	0.0035 U	0.0034 U	0.0036 U
Endosulfan sulfate	6700	410	0.04 U	0.018 U	0.0034 U	0.0038 J	0.00067 J	0.0034 U	0.019 U	0.0035 U	0.0034 U	0.0036 U
Endrin	340	21	0.04 U	0.018 U	0.0034 U	0.0048 U	0.0035 U	0.0034 U	0.019 U	0.0035 U	0.0034 U	0.0036 U
Endrin aldehyde	340	21	1.7 J	0.017 J	0.0019 J	0.0048 U	0.0064 J	0.0034 U	0.0061 J	0.001	0.0034 U	0.022
Endrin ketone	340	21	0.04 U	0.018 U	0.0034 U	0.0048 U	0.0035 U	0.0034 U	0.019 U	0.0035 U	0.0034 U	0.0036 U
(Lindane)	2.2	0.7	0.021 U	0.009 U	0.0018 U	0.0025 U	0.0018 U	0.0018 U	0.0096 U	0.0018 U	0.0017 U	0.0019 U
gamma-Chlordane	12	3.1	0.00092 J	0.009 U	0.0018 U	0.0025 U	0.0018 U	0.00014 J	0.0096 U	0.00028 U	0.00073 J	0.0035
Heptachlor	0.9	0.2	0.021 U	0.009 U	0.0018 U	0.0025 U	0.0018 U	0.0018 U	0.0021 J	0.0018 U	0.0017 U	0.0019 U
Heptachlor epoxide	0.4	0.1	0.021 U	0.019 J	0.0018 U	0.00094 J	0.00024 J	0.0018 U	0.0096 U	0.0018 U	0.0017 U	0.0019 U
Methoxychlor	7500	370	0.066 J	0.09 U	0.018 U	0.025 U	0.018 U	0.018 U	0.024 J	0.018 U	0.017 U	0.019 U
Toxaphene	3.7	1	2.1 U	0.9 U	0.18 U	0.25 U	0.18 U	0.18 U	0.96 U	0.18 U	0.17 U	0.19 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	026S000101	026S000201	026S000301	026S000401	026S000501	026S000601	027S000100	027S000101	027S000201	027S000202
4,4'-DDD	18	4.6	0.0018 J	0.00017 J	0.051	0.0038	0.0026 J	0.00037 J	0.00038 J	0.0088 J	0.0033 U	0.0033 U
4,4'-DDE	13	3.3	0.00057 J	0.00022 J	0.0055 J	0.0028 J	0.00075 J	0.00039 J	0.005 J	0.018 U	0.0029 J	0.00049 J
4,4'-DDT	13	3.3	0.0026 J	0.0013 J	0.0068 U	0.0062 J	0.0052	0.0034 U	0.008 J	0.043	0.0065 J	0.00085 J
Aldrin	0.3	0.07	0.00047 J	0.000033 J	0.0035 U	0.00013 J	0.000099 J	0.00037 J	0.0002 J	0.00098 J	0.0017 U	0.0017 U
alpha-BHC	0.5	0.2	0.0018 U		0.0035 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.009 U	0.0017 U	0.0017 U
alpha-Chlordane	12	3.1	0.0018 U		0.0023 J	0.0018 U	0.0019 U	0.0017 U	0.0003 J	0.021	0.0017 U	0.0017 U
Aroclor-1016	2.1	0.5	0.036 U		0.068 U	0.035 U	0.036 U	0.034 U	0.033 U	0.18 U	0.033 U	0.033 U
Aroclor-1221	2.1	0.5	0.073 U		0.14 U	0.07 U	0.074 U	0.069 U	0.067 U	0.36 U	0.067 U	0.066 U
Aroclor-1232	2.1	0.5	0.036 U		0.068 U	0.035 U	0.036 U	0.034 U	0.033 U	0.18 U	0.033 U	0.033 U
Aroclor-1242	2.1	0.5	0.036 U		0.068 U	0.035 U	0.036 U	0.034 U	0.033 U	0.18 U	0.033 U	0.033 U
Aroclor-1248	2.1	0.5	0.036 U		0.068 U	0.035 U	0.036 U	0.034 U	0.033 U	0.18 U	0.033 U	0.033 U
Aroclor-1254	2.1	0.5	0.036 U		0.068 U	0.035 U	0.036 U	0.034 U	0.033 U	0.18 U	0.033 U	0.033 U
Aroclor-1260	2.1	0.5	0.036 U		0.011 J	0.035 U	0.036 U	0.034 U	0.033 U	0.18 U	0.013 J	0.033 U
beta-BHC	2.1	0.6	0.0018 U		0.0035 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.009 U	0.0017 U	0.0017 U
delta-BHC	420	22	0.0018 U		0.0035 U	0.0018 U	0.0019 U	0.00018 J	0.0002 J	0.009 U	0.0017 U	0.0017 U
Dieldrin	0.3	0.07	0.00057 J	0.000054 J	0.0068 U	0.0013 J	0.00014 J	0.0004 J	0.0027 J	*** 0.8 D**	0.0019 J	0.0014 J
Endosulfan I	6700	410	0.0018 U		0.0035 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.009 U	0.0017 U	0.0017 U
Endosulfan II	6700	410	0.0036 U		0.0068 U	0.0035 U	0.0036 U	0.0034 U	0.0033 U	0.018 U	0.0033 U	0.0033 U
Endosulfan sulfate	6700	410	0.0036 U		0.0068 U	0.0035 U	0.0036 U	0.0034 U	0.00087 J	0.0022 J	0.0033 U	0.00031 U
Endrin	340	21	0.0036 U		0.0068 U	0.0005 J	0.00013 J	0.00033 J	0.0033 U	0.018 U	0.0033 U	0.0033 U
Endrin aldehyde	340	21	0.0036 U		0.0068 U	0.0035 U	0.0036 U	0.0034 U	0.00017 J	0.0034 J	0.0011 J	0.0033 U
Endrin ketone	340	21	0.0036 U		0.0068 U	0.00034 J	0.0036 U	0.00025 J	0.0033 U	0.018 U	0.0033 U	0.0033 U
(Lindane)	2.2	0.7	0.0018 U		0.0035 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.009 U	0.0017 U	0.0017 U
gamma-Chlordane	12	3.1	0.0018 U		0.0021 J	0.0018 U	0.0034	0.00021 J	0.0017 U	0.0011	0.0017 U	0.0017 U
Heptachlor	0.9	0.2	0.0018 U		0.0035 U	0.0018 U	0.0019 U	0.00012 J	0.0017 U	0.009 U	0.0017 U	0.0017 U
Heptachlor epoxide	0.4	0.1	0.0018 U		0.0035 U	0.0018 U	0.0019 U	0.00028 J	0.00012 J	0.00065 J	0.0017 U	0.0017 U
Methoxychlor	7500	370	0.00073 J		0.035 U	0.0034 J	0.019 U	0.00051 J	0.017 U	0.09 U	0.017 U	0.017 U
Toxaphene	3.7	1	0.18 U		0.35 U	0.18 U	0.19 U	0.17 U	0.17 U	0.9 U	0.17 U	0.17 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S000301	027S000302	027S000401	027S000402	027S000501	027S000502	027S000601	027S000602	027S000701	027S000702
4,4'-DDD	18	4.6	0.0035 U	0.0034 U	0.0033 U	0.011 J	0.0036 U	0.0034 U	0.017	0.0034 U	0.00017 J	0.0034 U
4,4'-DDE	13	3.3	0.00033 J	0.0034 U	0.0024 J	0.0018 J	0.00089 J	0.0034 U	0.056	0.0034 U	0.00014 J	0.0034 U
4,4'-DDT	13	3.3	0.00069 J	0.0034 U	0.0034 J	0.012 J	0.0018 J	0.0034 U	0.15	0.0034 U	0.00042 J	0.0034 U
Aldrin	0.3	0.07	0.0018 U	0.00013 J	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0046 U	0.0018 U	0.0018 U	0.0017 U
alpha-BHC	0.5	0.2	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0046 U	0.0018 U	0.0018 U	0.0017 U
alpha-Chlordane	12	3.1	0.00038 J	0.0017 U	0.00031 J	0.0017 U	0.0019 U	0.0018 U	0.00049 J	0.0018 U	0.0018 U	0.0017 U
Aroclor-1016	2.1	0.5	0.035 U	0.034 U	0.033 U	0.033 U	0.036 U	0.034 U	0.089 U	0.034 U	0.034 U	0.034 U
Aroclor-1221	2.1	0.5	0.07 U	0.068 U	0.068 U	0.067 U	0.074 U	0.07 U	0.18 U	0.069 U	0.069 U	0.069 U
Aroclor-1232	2.1	0.5	0.035 U	0.034 U	0.033 U	0.033 U	0.036 U	0.034 U	0.089 U	0.034 U	0.034 U	0.034 U
Aroclor-1242	2.1	0.5	0.035 U	0.034 U	0.033 U	0.033 U	0.036 U	0.034 U	0.089 U	0.034 U	0.034 U	0.034 U
Aroclor-1248	2.1	0.5	0.035 U	0.034 U	0.033 U	0.033 U	0.036 U	0.034 U	0.089 U	0.034 U	0.034 U	0.034 U
Aroclor-1254	2.1	0.5	0.035 U	0.034 U	0.033 U	0.033 U	0.0083 J	0.034 U	0.089 U	0.034 U	0.034 U	0.034 U
Aroclor-1260	2.1	0.5	0.0025 J	0.034 U	0.012 J	0.033 U	0.036 U	0.034 U	0.057 J	0.034 U	0.034 U	0.034 U
beta-BHC	2.1	0.6	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0046 U	0.0018 U	0.0018 U	0.0017 U
delta-BHC	420	22	0.0018 U	0.0017 U	0.00025 J	0.0017 U	0.0019 U	0.0018 U	0.0046 U	0.0018 U	0.0018 U	0.0017 U
Dieldrin	0.3	0.07	0.00042 J	0.0034 U	0.021 J	0.011 J	0.0036 U	0.0034 U	***0.36**	0.0034 U	0.00013 J	0.0034 U
Endosulfan I	6700	410	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0046 U	0.0018 U	0.0018 U	0.0017 U
Endosulfan II	6700	410	0.0035 U	0.0034 U	0.0033 U	0.0033 U	0.0036 U	0.0034 U	0.0089 U	0.0034 U	0.0034 U	0.0034 U
Endosulfan sulfate	6700	410	0.0035 U	0.0034 U	0.0033 U	0.0033 U	0.0036 U	0.0034 U	0.001 J	0.0034 U	0.0034 U	0.0034 U
Endrin	340	21	0.0035 U	0.0034 U	0.0033 U	0.0033 U	0.0036 U	0.0034 U	0.0089 U	0.0034 U	0.00027 J	0.0034 U
Endrin aldehyde	340	21	0.0035 U	0.0034 U	0.0033 U	0.0033 U	0.00078 J	0.0034 U	0.0089 U	0.0034 U	0.0034 U	0.0034 U
Endrin ketone	340	21	0.0035 U	0.0034 U	0.0033 U	0.0016 J	0.0036 U	0.0034 U	0.003 J	0.0034 U	0.0034 U	0.0034 U
(Lindane)	2.2	0.7	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0046 U	0.0018 U	0.0018 U	0.0017 U
gamma-Chlordane	12	3.1	0.00034 J	0.0017 U	0.00012 J	0.00048 J	0.00033 J	0.0018 U	0.0025 J	0.0018 U	0.0018 U	0.0017 U
Heptachlor	0.9	0.2	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.00052 J	0.0018 U	0.0018 U	0.0017 U
Heptachlor epoxide	0.4	0.1	0.00012 J	0.0017 U	0.00065 J	0.0022 J	0.00021 J	0.0018 U	0.0031 J	0.0018 U	0.0018 U	0.0017 U
Methoxychlor	7500	370	0.018 U	0.017 U	0.017 U	0.017 U	0.019 U	0.018 U	0.046 U	0.018 U	0.018 U	0.017 U
Toxaphene	3.7	1	0.18 U	0.17 U	0.17 U	0.17 U	0.19 U	0.18 U	0.46 U	0.18 U	0.18 U	0.17 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S000801	027S000802	027S000901	027S000902	027S001002	027S001202	027S001302 6/14/1993	027S001402 6/14/1993
4,4'-DDD	18	4.6	0.0033 U	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.0034 U	0.0037 U	0.0034 U
4,4'-DDE	13	3.3	0.0025 J	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.00037 J	0.0037 U	0.0034 U
4,4'-DDT	13	3.3	0.0042 J	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.00011 J	0.0037 U	0.0034 U
Aldrin	0.3	0.07	0.000074 J	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
alpha-BHC	0.5	0.2	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
alpha-Chlordane	12	3.1	0.00014 J	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
Aroclor-1016	2.1	0.5	0.033 U	0.036 U	0.036 U	0.034 U	0.036 U	0.034 U	0.037 U	0.034 U
Aroclor-1221	2.1	0.5	0.067 U	0.073 U	0.072 U	0.069 U	0.073 U	0.069 U	0.074 U	0.068 U
Aroclor-1232	2.1	0.5	0.033 U	0.036 U	0.036 U	0.034 U	0.036 U	0.034 U	0.037 U	0.034 U
Aroclor-1242	2.1	0.5	0.033 U	0.036 U	0.036 U	0.034 U	0.036 U	0.034 U	0.037 U	0.034 U
Aroclor-1248	2.1	0.5	0.033 U	0.036 U	0.036 U	0.034 U	0.036 U	0.034 U	0.037 U	0.034 U
Aroclor-1254	2.1	0.5	0.033 U	0.036 U	0.036 U	0.034 U	0.036 U	0.034 U	0.037 U	0.034 U
Aroclor-1260	2.1	0.5	0.023 J	0.036 U	0.036 U	0.034 U	0.036 U	0.034 U	0.037 U	0.034 U
beta-BHC	2.1	0.6	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
delta-BHC	420	22	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.00018 J	0.0017 U	0.00028 J	0.0017 U
Dieldrin	0.3	0.07	0.032	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.0034 U	0.0037 U	0.0034 U
Endosulfan I	6700	410	0.000084 J	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
Endosulfan II	6700	410	0.0033	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.0034 U	0.0037 U	0.0034 U
Endosulfan sulfate	6700	410	0.0033 U	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.0034 U	0.0037 U	0.0034 U
Endrin	340	21	0.0033 U	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.0034 U	0.0037 U	0.0034 U
Endrin aldehyde	340	21	0.00047 J	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.0034 U	0.0037 U	0.0034 U
Endrin ketone	340	21	0.0033 U	0.0036 U	0.0036 U	0.0034 U	0.0036 U	0.0034 U	0.0037 U	0.0034 U
(Lindane)	2.2	0.7	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
gamma-Chlordane	12	3.1	0.00011 J	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
Heptachlor	0.9	0.2	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
Heptachlor epoxide	0.4	0.1	0.000048 J	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0019 U	0.0017 U
Methoxychlor	7500	370	0.0019 J	0.018 U	0.018 U	0.018 U	0.018 U	0.017 U	0.019 U	0.017 U
Toxaphene	3.7	1	0.17 U	0.18 U	0.18 U	0.18 U	0.18 U	0.17 U	0.19 U	0.17 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S001501 6/15/1993	027S001701 6/17/1993	027S001702	027S001900	027S002000	027S002002	027S002102	027S002202
4,4'-DDD	18	4.6	0.0034 U	0.00032 J	0.0035 U	0.00073 J	0.021 U	0.0036 U	0.0035 U	0.0035 U
4,4'-DDE	13	3.3	0.0034 U	0.00055 U	0.0035 U	0.026 J	0.021 U	0.0036 U	0.0035 U	0.0035 U
4,4'-DDT	13	3.3	0.0034 U	0.0015 J	0.00043	0.032 J	0.014 J	0.0036 U	0.0035 U	0.0035 U
Aldrin	0.3	0.07	0.0017 U	0.0017 U	0.0018 U	0.00017 J	0.011 U	0.0018 U	0.0018 U	0.0018 U
alpha-BHC	0.5	0.2	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0014 J	0.0018 U	0.0018 U	0.0018 U
alpha-Chlordane	12	3.1	0.0017 U	0.00028 J	0.00014 J	0.0009 J	0.011 U	0.0018 U	0.0018 U	0.0018 U
Aroclor-1016	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.21 U	0.036 U	0.035 U	0.035 U
Aroclor-1221	2.1	0.5	0.069 U	0.068 U	0.072 U	0.071 U	0.43 U	0.073 U	0.071 U	0.071 U
Aroclor-1232	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.21 U	0.036 U	0.035 U	0.035 U
Aroclor-1242	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.21 U	0.036 U	0.035 U	0.035 U
Aroclor-1248	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.21 U	0.036 U	0.035 U	0.035 U
Aroclor-1254	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.21 U	0.036 U	0.035 U	0.035 U
Aroclor-1260	2.1	0.5	0.034 U	0.034 U	0.022	0.062 J	0.21 U	0.036 U	0.035 U	0.035 U
beta-BHC	2.1	0.6	0.0017 U	0.0017 U	0.0018 U	0.00085 J	0.011 U	0.0018 U	0.0018 U	0.0018 U
delta-BHC	420	22	0.0017 U	0.0017 U	0.0018 U	0.00035 J	0.011 U	0.0018 U	0.0018 U	0.0018 U
Dieldrin	0.3	0.07	0.0034 U	0.00085 J	0.0038	0.019 J	0.0029 J	0.00055 J	0.00019 U	0.0035 U
Endosulfan I	6700	410	0.0017 U	0.0017 U	0.0018 U	0.00011 J	0.011 U	0.0018 U	0.0018 U	0.0018 U
Endosulfan II	6700	410	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.021 U	0.0036 U	0.0035 U	0.0035 U
Endosulfan sulfate	6700	410	0.0034 U	0.0021 J	0.0035 U	0.00036 J	0.021 U	0.0036 U	0.0035 U	0.0035 U
Endrin	340	21	0.0034 U	0.0034 U	0.0035 U	0.000071 J	0.021 U	0.0036 U	0.0035 U	0.0035 U
Endrin aldehyde	340	21	0.0034 U	0.00025 J	0.001 J	0.0035 U	0.021 U	0.0036 U	0.0035 U	0.0035 U
Endrin ketone	340	21	0.0034 U	0.00024 U	0.0035 U	0.0035 U	0.021 U	0.0036 U	0.0035 U	0.0035 U
(Lindane)	2.2	0.7	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.011 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane	12	3.1	0.00029 U	0.0017 U	0.0018 U	0.00085 J	0.0012 J	0.0018 U	0.0018 U	0.0018 U
Heptachlor	0.9	0.2	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.011 U	0.0018 U	0.0018 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0017 U	0.00023 J	0.0018 U	0.0018 U	0.011 U	0.0018 U	0.0018 U	0.0018 U
Methoxychlor	7500	370	0.017 U	0.017 U	0.018 U	0.018 U	0.11 U	0.018 U	0.018 U	0.018 U
Toxaphene	3.7	1	0.17 U	0.17 U	0.18 U	0.18 U	1.1 U	0.18 U	0.18 U	0.18 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S002302	027S002402	027S002600	027S002602 7/6/1993	027S002701	027S002702	027S002802	027S002902	027S003002
4,4'-DDD	18	4.6	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.00092 J	0.001 J	0.0039 U	0.0034 U	0.0033 U
4,4'-DDE	13	3.3	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.00084 J	0.0011 J	0.00027 U	0.0034 U	0.0033 U
4,4'-DDT	13	3.3	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0017 J	0.0017 J	0.0039 U	0.0034 U	0.0033 U
Aldrin	0.3	0.07	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.002 U	0.0018 U	0.0017 U
alpha-BHC	0.5	0.2	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.002 U	0.0018 U	0.0017 U
alpha-Chlordane	12	3.1	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.002 U	0.0018 U	0.0017 U
Aroclor-1016	2.1	0.5	0.035 U	0.035 U	0.035 U	0.036 U	0.033 U	0.033 U	0.039 U	0.034 U	0.033 U
Aroclor-1221	2.1	0.5	0.07 U	0.072 U	0.071 U	0.073 U	0.068 U	0.068 U	0.08 U	0.07 U	0.068 U
Aroclor-1232	2.1	0.5	0.035 U	0.035 U	0.035 U	0.036 U	0.033 U	0.033 U	0.039 U	0.034 U	0.033 U
Aroclor-1242	2.1	0.5	0.035 U	0.035 U	0.035 U	0.036 U	0.033 U	0.033 U	0.039 U	0.034 U	0.033 U
Aroclor-1248	2.1	0.5	0.035 U	0.035 U	0.035 U	0.036 U	0.033 U	0.033 U	0.039 U	0.034 U	0.033 U
Aroclor-1254	2.1	0.5	0.035 U	0.035 U	0.035 U	0.036 U	0.033 U	0.033 U	0.039 U	0.034 U	0.033 U
Aroclor-1260	2.1	0.5	0.035 U	0.035 U	0.035 U	0.036 U	0.033 U	0.033 U	0.039 U	0.034 U	0.033 U
beta-BHC	2.1	0.6	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.002 U	0.0018 U	0.0017 U
delta-BHC	420	22	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.00019 J	0.00053 J	0.002 U	0.0018 U	0.0017 U
Dieldrin	0.3	0.07	0.0035 U	0.0019 J	0.0035 U	0.0036 U	0.00017 J	0.00021 J	0.0039 U	0.0034 U	0.0033 U
Endosulfan I	6700	410	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0017 U	0.00022 J	0.002 U	0.0018 U	0.0017 U
Endosulfan II	6700	410	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0033 U	0.0033 U	0.0039 U	0.0034 U	0.0033 U
Endosulfan sulfate	6700	410	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.00072 J	0.0033 U	0.0039 U	0.0034 U	0.0033 U
Endrin	340	21	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0033 U	0.0033 U	0.0039 U	0.0034 U	0.0033 U
Endrin aldehyde	340	21	0.00067 J	0.0035 U	0.0035 U	0.0036 U	0.0033 U	0.0033 U	0.0039 U	0.0034 U	0.0033 U
Endrin ketone	340	21	0.0035 U	0.0035 U	0.0035 U	0.0036 U	0.0033 U	0.0033 U	0.0039 U	0.0034 U	0.0033 U
(Lindane)	2.2	0.7	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0017 U	0.0017 U	0.002 U	0.0018 U	0.0017 U
gamma-Chlordane	12	3.1	0.0018 U	0.0018 U	0.0018 U	0.0019 U	0.0017 U	0.00026 J	0.002 U	0.0018 U	0.0017 U
Heptachlor	0.9	0.2	0.0018 U	0.0018 U	0.000046 U	0.000076 J	0.0017 U	0.0017 U	0.002 U	0.0018 U	0.0017 U
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0018 U	0.0018 U	0.000046 J	0.0003 J	0.00051 J	0.002 U	0.0018 U	0.0017 U
Methoxychlor	7500	370	0.018 U	0.018 U	0.018 U	0.019 U	0.011 J	0.017 U	0.02 U	0.018 U	0.017 U
Toxaphene	3.7	1	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.17 U	0.2 U	0.18 U	0.17 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S003202	027S003302	027S004000	027S004002	027S004100	027S004102	027S004202	027S004302	027S004402	027S004502
4,4'-DDD	18	4.6	0.0034 U	0.0034 U	0.00079 J	0.0035 U	0.0077 U	0.00034 J	0.0034 U	0.0034 U	0.00092 J	0.0034 U
4,4'-DDE	13	3.3	0.0034 U	0.0034 U	0.0017 J	0.0035 U	0.00069 J	0.0034 U	0.0034 U	0.0034 U	0.00064 J	0.00082 J
4,4'-DDT	13	3.3	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0014 J	0.0034 U	0.00028 J	0.0003 J	0.0047 J	0.0022 J
Aldrin	0.3	0.07	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.004 U	0.00014 J	0.00005 U	0.0018 U	0.0018 U	0.0017 U
alpha-BHC	0.5	0.2	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.004 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
alpha-Chlordane	12	3.1	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0022 J	0.00023 J	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Aroclor-1016	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.077 U	0.034 U	0.034 U	0.034 U	0.035 U	0.034 U
Aroclor-1221	2.1	0.5	0.07 U	0.069 U	0.071 U	0.071 U	0.16 U	0.07 U	0.07 U	0.07 U	0.07 U	0.069 U
Aroclor-1232	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.077 U	0.034 U	0.034 U	0.034 U	0.035 U	0.034 U
Aroclor-1242	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.077 U	0.034 U	0.034 U	0.034 U	0.035 U	0.034 U
Aroclor-1248	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.077 U	0.034 U	0.034 U	0.034 U	0.035 U	0.034 U
Aroclor-1254	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.077 U	0.034 U	0.034 U	0.034 U	0.035 U	0.034 U
Aroclor-1260	2.1	0.5	0.034 U	0.034 U	0.035 U	0.035 U	0.077 U	0.034 U	0.034 U	0.034 U	0.035 U	0.028 J
beta-BHC	2.1	0.6	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.004 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
delta-BHC	420	22	0.0018 U	0.0018 U	0.0018 U	0.000063 J	0.004 U	0.0018 U	0.0018 U	0.0018 U	0.00044 J	0.0017 U
Dieldrin	0.3	0.07	0.0034 U	0.0034 U	0.0035 U	0.000079 J	0.0027 J	0.002 J	0.00012 U	0.0034 U	0.0039	0.0018 J
Endosulfan I	6700	410	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.004 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Endosulfan II	6700	410	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0077 U	0.0034 U	0.0034 U	0.0034 U	0.0035 U	0.0034 U
Endosulfan sulfate	6700	410	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0077 U	0.0001 J	0.0034 U	0.0034 U	0.0035 U	0.00084 J
Endrin	340	21	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0077 U	0.0034 U	0.00013 J	0.0034 U	0.0035 U	0.0034 U
Endrin aldehyde	340	21	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0077 U	0.0034 U	0.0034 U	0.0034 U	0.0035 U	0.0034 U
Endrin ketone	340	21	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0077 U	0.00019 J	0.0034 U	0.0034 U	0.0035 U	0.0034 U
(Lindane)	2.2	0.7	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.004 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
gamma-Chlordane	12	3.1	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.004 U	0.0018 U	0.0018 U	0.0018 U	0.00029 J	0.00032 U
Heptachlor	0.9	0.2	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.004 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0018 U	0.00016 J	0.0018 U	0.00054 J	0.0014 J	0.0018 U	0.0018 U	0.00017 J	0.00016 J
Methoxychlor	7500	370	0.018 U	0.018 U	0.042 J	0.018 U	0.04 U	0.018 U	0.018 U	0.018 U	0.018 U	0.017 U
Toxaphene	3.7	1	0.18 U	0.18 U	0.18 U	0.18 U	0.4 U	0.18 U	0.18 U	0.18 U	0.18 U	0.17 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S004602	027S004702	027S004902	027S005002	027S005102	027S005200	027S005201	027S005202	027S005300	027S005301
4,4'-DDD	18	4.6	0.0035 U	0.0034 U	0.00027 J	0.0035 U	0.0034 U	0.017 U	0.0034 U	0.0048	0.001 J	0.0051 J
4,4'-DDE	13	3.3	0.0035 U	0.0034 U	0.0043	0.0035 U	0.0034 U	0.017 U	0.00024 J	0.00048 J	0.012	0.022
4,4'-DDT	13	3.3	0.0035 U	0.0034 U	0.0054	0.0035 U	0.0034 U	0.024	0.0036 J	0.0044 J	0.015	0.05 J
Aldrin	0.3	0.07	0.0018 U	0.0017 U	0.00061 J	0.00019 J	0.0017 U	0.00033 J	0.000053 J	0.0023 U	0.0018 U	0.0018 U
alpha-BHC	0.5	0.2	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0017 U	0.00034 J	0.000044 J	0.0023 U	0.0018 U	0.0001 J
alpha-Chlordane	12	3.1	0.0018 U	0.0017 U	0.000087 U	0.0018 U	0.0017 U	0.0087 U	0.0018 U	0.00034 J	0.0016 J	0.0069
Aroclor-1016	2.1	0.5	0.035 U	0.034 U	0.036 U	0.035 U	0.034 U	0.17 U	0.034 U	0.044 U	0.035 U	0.034 U
Aroclor-1221	2.1	0.5	0.071 U	0.068 U	0.072 U	0.071 U	0.069 U	0.34 U	0.07 U	0.09 U	0.071 U	0.069 U
Aroclor-1232	2.1	0.5	0.035 U	0.034 U	0.036 U	0.035 U	0.034 U	0.17 U	0.034 U	0.044 U	0.035 U	0.034 U
Aroclor-1242	2.1	0.5	0.035 U	0.034 U	0.036 U	0.035 U	0.034 U	0.17 U	0.034 U	0.044 U	0.035 U	0.034 U
Aroclor-1248	2.1	0.5	0.035 U	0.034 U	0.036 U	0.035 U	0.034 U	0.17 U	0.034 U	0.044 U	0.035 U	0.034 U
Aroclor-1254	2.1	0.5	0.035 U	0.034 U	0.036 U	0.035 U	0.034 U	0.17 U	0.034 U	0.044 U	0.035 U	0.034 U
Aroclor-1260	2.1	0.5	0.035 U	0.034 U	0.036 U	0.035 U	0.034 U	0.17 U	0.034 U	0.044 U	0.035 U	0.034 U
beta-BHC	2.1	0.6	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0017 U	0.0087 U	0.0018 U	0.0023 U	0.0018 U	0.0018 U
delta-BHC	420	22	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0017 U	0.0087 U	0.0018 U	0.0023 U	0.0018 U	0.0018 U
Dieldrin	0.3	0.07	0.0038 U	0.0034 U	0.047	0.0035 U	0.0034 U	0.041	0.026 J	0.019	0.0013 J	0.0031 J
Endosulfan I	6700	410	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0017 U	0.0087 U	0.0018 U	0.0023 U	0.0018 U	0.0018 U
Endosulfan II	6700	410	0.0035 U	0.0034 U	0.0036 U	0.0035 U	0.0034 U	0.017 U	0.0034 U	0.0044 U	0.0035 U	0.0034 U
Endosulfan sulfate	6700	410	0.0035 U	0.0034 U	0.00021 J	0.0035 U	0.0034 U	0.017 U	0.0034 U	0.0044 U	0.0035 U	0.0034 U
Endrin	340	21	0.0035 U	0.0034 U	0.00016 J	0.0035 U	0.0034 U	0.017 U	0.0034 U	0.0044 U	0.0035 U	0.0019 J
Endrin aldehyde	340	21	0.0035 U	0.0034 U	0.0036 U	0.0035 U	0.0034 U	0.017 U	0.0006 J	0.0012 J	0.0035 U	0.0028 J
Endrin ketone	340	21	0.0035 U	0.0034 U	0.0036 U	0.0035 U	0.0034 U	0.0028 J	0.00025 J	0.0044 U	0.0035 U	0.00048 J
(Lindane)	2.2	0.7	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0017 U	0.0087 U	0.0018 U	0.0023 U	0.00043 J	0.0018 U
gamma-Chlordane	12	3.1	0.0018 U	0.0017 U	0.000067 U	0.0018 U	0.0017 U	0.0087 U	0.00036 J	0.00038 J	0.00083 J	0.0042 J
Heptachlor	0.9	0.2	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0017 U	0.0087 U	0.0018 U	0.0023 U	0.0018 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0017 U	0.000068 J	0.0018 U	0.0017 U	0.0087 U	0.0018 U	0.0023 U	0.0018 U	0.00013 J
Methoxychlor	7500	370	0.018 U	0.017 U	0.0021 J	0.0004 J	0.017 U	0.069 J	0.053 J	0.0011 J	0.0031 J	0.058 J
Toxaphene	3.7	1	0.18 U	0.17 U	0.18 U	0.18 U	0.17 U	0.87 U	0.18 U	0.23 U	0.18 U	0.18 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S005302	030S000402	030S000502	030S000602	030S001002	030S001102	030S001202	030S001602	030S001702	030S001802
4,4'-DDD	18	4.6	0.00053 J	0.0034 U	0.0033 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0034 U	0.0034 U
4,4'-DDE	13	3.3	0.0033 U	0.0034 U	0.0033 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0045	0.0034 U	0.0062
4,4'-DDT	13	3.3	0.003 J	0.0034 U	0.0033 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.018	0.0034 U	0.0072
Aldrin	0.3	0.07	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
alpha-BHC	0.5	0.2	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
alpha-Chlordane	12	3.1	0.00013 J	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Aroclor-1016	2.1	0.5	0.033 U	0.034 U	0.033 U	0.034 U	0.034 U	0.035 U	0.035 U	0.035 U	0.034 U	0.034 U
Aroclor-1221	2.1	0.5	0.067 U	0.069 U	0.068 U	0.07 U	0.069 U	0.072 U	0.07 U	0.072 U	0.07 U	0.068 U
Aroclor-1232	2.1	0.5	0.033 U	0.034 U	0.033 U	0.034 U	0.034 U	0.035 U	0.035 U	0.035 U	0.034 U	0.034 U
Aroclor-1242	2.1	0.5	0.033 U	0.034 U	0.033 U	0.034 U	0.034 U	0.035 U	0.035 U	0.035 U	0.034 U	0.034 U
Aroclor-1248	2.1	0.5	0.033 U	0.034 U	0.033 U	0.034 U	0.034 U	0.035 U	0.035 U	0.035 U	0.034 U	0.034 U
Aroclor-1254	2.1	0.5	0.033 U	0.034 U	0.033 U	0.034 U	0.034 U	0.035 U	0.035 U	0.035 U	0.034 U	0.034 U
Aroclor-1260	2.1	0.5	0.033 U	0.034 U	0.033 U	0.034 U	0.034 U	0.035 U	0.12	0.035 U	0.034 U	0.034 U
beta-BHC	2.1	0.6	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
delta-BHC	420	22	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Dieldrin	0.3	0.07	0.0033 U	0.0034 U	0.039	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0034 U	0.0034 U
Endosulfan I	6700	410	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Endosulfan II	6700	410	0.0033 U	0.0034 U	0.0033 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0034 U	0.0034 U
Endosulfan sulfate	6700	410	0.0033 U	0.0034 U	0.0033 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0034 U	0.0034 U
Endrin	340	21	0.0033 U	0.0034 U	0.0033 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0034 U	0.0034 U
Endrin aldehyde	340	21	0.0033 U	0.0034 U	0.0033 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0034 U	0.0034 U
Endrin ketone	340	21	0.0033 U	0.0034 U	0.0033 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0035 U	0.0034 U	0.0034 U
(Lindane)	2.2	0.7	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
gamma-Chlordane	12	3.1	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Heptachlor	0.9	0.2	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Heptachlor epoxide	0.4	0.1	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U
Methoxychlor	7500	370	0.0026 J	0.017 U	0.017 U	0.018 U	0.017 U	0.018 U	0.018 U	0.018 U	0.018 U	0.017 U
Toxaphene	3.7	1	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.18 U	0.18 U	0.18 U	0.18 U	0.17 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S002002	030S005302	030S005902	030S006102	030S010101	030S010201	030S010202	030S010301	030S010401	030S010502
4,4'-DDD	18	4.6	0.017	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.011	0.0034 U	0.0037 U	0.0036 U	0.0036 U
4,4'-DDE	13	3.3	0.12 D	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.054 D	0.0034 U	0.0037 U	0.0036 U	0.0036 U
4,4'-DDT	13	3.3	0.087 D	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.045	0.0034 U	0.0037 U	0.0036 U	0.0036 U
Aldrin	0.3	0.07	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
alpha-BHC	0.5	0.2	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
alpha-Chlordane	12	3.1	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
Aroclor-1016	2.1	0.5	0.034 U	0.036 U	0.036 U	0.035 U	0.034 U	0.034 U	0.034 U	0.037 U	0.036 U	0.036 U
Aroclor-1221	2.1	0.5	0.068 U	0.073 U	0.072 U	0.071 U	0.068 U	0.07 U	0.069 U	0.074 U	0.074 U	0.072 U
Aroclor-1232	2.1	0.5	0.034 U	0.036 U	0.036 U	0.035 U	0.034 U	0.034 U	0.034 U	0.037 U	0.036 U	0.036 U
Aroclor-1242	2.1	0.5	0.034 U	0.036 U	0.036 U	0.035 U	0.034 U	0.034 U	0.034 U	0.037 U	0.036 U	0.036 U
Aroclor-1248	2.1	0.5	0.034 U	0.036 U	0.036 U	0.035 U	0.034 U	0.034 U	0.034 U	0.037 U	0.036 U	0.036 U
Aroclor-1254	2.1	0.5	0.034 U	0.036 U	0.036 U	0.035 U	0.034 U	0.034 U	0.034 U	0.037 U	0.036 U	0.036 U
Aroclor-1260	2.1	0.5	0.25	0.036 U	0.036 U	0.035 U	0.034 U	0.034 U	0.034 U	0.037 U	0.036 U	0.036 U
beta-BHC	2.1	0.6	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
delta-BHC	420	22	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
Dieldrin	0.3	0.07	0.0034 U	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U	0.0034 U	0.0037 U	0.0036 U	0.0036 U
Endosulfan I	6700	410	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
Endosulfan II	6700	410	0.0078	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U	0.0034 U	0.0037 U	0.0036 U	0.0036 U
Endosulfan sulfate	6700	410	0.0034 U	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U	0.0034 U	0.0037 U	0.0036 U	0.0036 U
Endrin	340	21	0.0034 U	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U	0.0034 U	0.0037 U	0.0036 U	0.0036 U
Endrin aldehyde	340	21	0.0034 U	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U	0.0034 U	0.0037 U	0.0036 U	0.0036 U
Endrin ketone	340	21	0.0034 U	0.0036 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U	0.0034 U	0.0037 U	0.0036 U	0.0036 U
(Lindane)	2.2	0.7	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
gamma-Chlordane	12	3.1	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
Heptachlor	0.9	0.2	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
Methoxychlor	7500	370	0.017 U	0.018 U	0.018 U	0.018 U	0.017 U	0.018 U	0.017 U	0.019 U	0.019 U	0.018 U
Toxaphene	3.7	1	0.17 U	0.18 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.19 U	0.18 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S010601	030S010802	030S010901	030S011001	030S011102	030S011201	030S011301	030S011401	030S011501	030S011601
4,4'-DDD	18	4.6	0.0033 U	0.0034 U	0.0036 U	0.008	0.0033 U	0.0033 U	0.0037 U	0.0034 U	0.0035 U	0.0035 U
4,4'-DDE	13	3.3	0.0073	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.0033 U	0.0037 U	0.0034 U	0.0035 U	0.0035 U
4,4'-DDT	13	3.3	0.023 J	0.0034 U	0.0036 U	0.026	0.0033 U	0.0057	0.0037 U	0.0034 U	0.0035 U	0.0035 U
Aldrin	0.3	0.07	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
alpha-BHC	0.5	0.2	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
alpha-Chlordane	12	3.1	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0024 J	0.0019
Aroclor-1016	2.1	0.5	0.033 U	0.034 U	0.036 U	0.033 U	0.033 U	0.033 U	0.037 U	0.034 U	0.035 U	0.035 U
Aroclor-1221	2.1	0.5	0.067 U	0.069 U	0.073 U	0.067 U	0.067 U	0.067 U	0.074 U	0.07 U	0.071 U	0.072 U
Aroclor-1232	2.1	0.5	0.033 U	0.034 U	0.036 U	0.033 U	0.033 U	0.033 U	0.037 U	0.034 U	0.035 U	0.035 U
Aroclor-1242	2.1	0.5	0.033 U	0.034 U	0.036 U	0.033 U	0.033 U	0.033 U	0.037 U	0.034 U	0.035 U	0.035 U
Aroclor-1248	2.1	0.5	0.033 U	0.034 U	0.036 U	0.033 U	0.033 U	0.033 U	0.037 U	0.034 U	0.035 U	0.035 U
Aroclor-1254	2.1	0.5	0.033 U	0.034 U	0.036 U	0.033 U	0.033 U	0.033 U	0.037 U	0.034 U	0.035 U	0.035 U
Aroclor-1260	2.1	0.5	0.093	0.034 U	0.036 U	0.033 U	0.033 U	0.033 U	0.037 U	0.034 U	0.035 U	0.035 U
beta-BHC	2.1	0.6	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
delta-BHC	420	22	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
Dieldrin	0.3	0.07	0.015	0.0034 U	0.0036 U	0.0038	0.0033 U	0.0033 U	0.0037 U	0.0034 U	0.0035 U	0.0035 U
Endosulfan I	6700	410	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
Endosulfan II	6700	410	0.0033 U	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.0033 U	0.0037 U	0.0034 U	0.0035 U	0.0035 U
Endosulfan sulfate	6700	410	0.0033 U	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.0033 U	0.0037 U	0.0034 U	0.0035 U	0.0035 U
Endrin	340	21	0.0033 U	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.0033 U	0.0037 U	0.0034 U	0.0035 U	0.0035 U
Endrin aldehyde	340	21	0.0033 U	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.0033 U	0.0037 U	0.0034 U	0.0035 U	0.0035 U
Endrin ketone	340	21	0.0033 U	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.0033 U	0.0037 U	0.0034 U	0.0035 U	0.0035 U
(Lindane)	2.2	0.7	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane	12	3.1	0.002	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0083	0.0018 U
Heptachlor	0.9	0.2	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
Methoxychlor	7500	370	0.017 U	0.017 U	0.018 U	0.017 U	0.017 U	0.017 U	0.019 U	0.018 U	0.018 U	0.018 U
Toxaphene	3.7	1	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.19 U	0.18 U	0.18 U	0.18 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S011701	030S011802	030S012001	030S012201	030S012301	030S012401	030S012501	030S012602	030S012701	030S012801
4,4'-DDD	18	4.6	0.0035 U	0.0035 U	0.0069	0.0034 U	0.0033 U	0.0037 U	0.012 J	0.0035 U	0.0034 U	0.0034 U
4,4'-DDE	13	3.3	0.0035 U	0.0035 U	0.0081	0.0034 U	0.0033 U	0.0045	0.017	0.0035 U	0.0042	0.0034 U
4,4'-DDT	13	3.3	0.0035 U	0.0035 U	0.019	0.0034 U	0.0033 U	0.0037 U	0.0036 U	0.0035 U	0.0034 U	0.004 U
Aldrin	0.3	0.07	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
alpha-BHC	0.5	0.2	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
alpha-Chlordane	12	3.1	0.0018 U	0.0018 U	0.0017 U	0.0041 J	0.0017 U	0.0019 U	0.0027 J	0.0018 U	0.0018 U	0.0018 U
Aroclor-1016	2.1	0.5	0.035 U	0.035 U	0.034 U	0.034 U	0.033 U	0.037 U	0.036 U	0.035 U	0.034 U	0.034 U
Aroclor-1221	2.1	0.5	0.07 U	0.07 U	0.069 U	0.068 U	0.068 U	0.076 U	0.074 U	0.071 U	0.069 U	0.07 U
Aroclor-1232	2.1	0.5	0.035 U	0.035 U	0.034 U	0.034 U	0.033 U	0.037 U	0.036 U	0.035 U	0.034 U	0.034 U
Aroclor-1242	2.1	0.5	0.035 U	0.035 U	0.034 U	0.034 U	0.033 U	0.037 U	0.036 U	0.035 U	0.034 U	0.034 U
Aroclor-1248	2.1	0.5	0.035 U	0.035 U	0.034 U	0.034 U	0.033 U	0.037 U	0.036 U	0.035 U	0.034 U	0.034 U
Aroclor-1254	2.1	0.5	0.035 U	0.035 U	0.034 U	0.034 U	0.033 U	0.037 U	0.036 U	0.035 U	0.082	0.069
Aroclor-1260	2.1	0.5	0.035 U	0.035 U	0.034 U	0.034 U	0.033 U	0.082	0.24	0.035 U	0.075	0.034 U
beta-BHC	2.1	0.6	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
delta-BHC	420	22	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
Dieldrin	0.3	0.07	0.0035 U	0.0035 U	0.006	0.01	0.014	0.018	0.032	0.0035 U	0.011	0.006
Endosulfan I	6700	410	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
Endosulfan II	6700	410	0.0035 U	0.0035 U	0.0034 U	0.0034 U	0.0033 U	0.0037 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U
Endosulfan sulfate	6700	410	0.0035 U	0.0035 U	0.0034 U	0.0034 U	0.0033 U	0.0037 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U
Endrin	340	21	0.0035 U	0.0035 U	0.0034 U	0.0034 U	0.0033 U	0.0037 U	0.0038 J	0.0035 U	0.0034 U	0.0034 U
Endrin aldehyde	340	21	0.0035 U	0.0035 U	0.0034 U	0.0034 U	0.0033 U	0.0037 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U
Endrin ketone	340	21	0.0035 U	0.0035 U	0.0034 U	0.0034 U	0.0033 U	0.0037 U	0.0036 U	0.0035 U	0.0034 U	0.0034 U
(Lindane)	2.2	0.7	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane	12	3.1	0.0018 U	0.0018 U	0.0017 U	0.0034	0.0017 U	0.0019 U	0.0042 J	0.0018 U	0.0018 U	0.0018 U
Heptachlor	0.9	0.2	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U
Methoxychlor	7500	370	0.018 U	0.018 U	0.017 U	0.017 U	0.017 U	0.019 U	0.019 U	0.018 U	0.018 U	0.018 U
Toxaphene	3.7	1	0.18 U	0.18 U	0.17 U	0.17 U	0.17 U	0.19 U	0.19 U	0.18 U	0.18 U	0.18 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S012901	030S013001	030S013401	030S013501	030S013701	030S013801	030S013901	030S014001	030S014101	030S014201
4,4'-DDD	18	4.6	0.0035 U	0.005	0.0044 U	0.0034 U	0.0036 U		0.0035 U	0.0048 J	0.0036 U	0.0034 U
4,4'-DDE	13	3.3	0.0035 U	0.0044 U	0.0044 U	0.0036	0.0077 J	0.06 J	0.0066	0.012 J	0.0036 U	0.0034 U
4,4'-DDT	13	3.3	0.0035 U	0.0086 J	0.0044 U	0.0078	0.024 J		0.0063	0.01 J	0.0036 U	0.0034 U
Aldrin	0.3	0.07	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0019 U	0.036 UD	0.0018 U	0.0017 U	0.0019 U	0.0017 U
alpha-BHC	0.5	0.2	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0019 U		0.0018 U	0.0017 U	0.0019 U	0.0017 U
alpha-Chlordane	12	3.1	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0025 J		0.0018 U	0.0017 U	0.0019 U	0.0017 U
Aroclor-1016	2.1	0.5	0.035 U	0.044 U	0.044 U	0.034 U	0.036 U		0.035 U	0.034 U	0.036 U	0.034 U
Aroclor-1221	2.1	0.5	0.072 U	0.09 U	0.089 U	0.068 U	0.074 U		0.07 U	0.068 U	0.073 U	0.068 U
Aroclor-1232	2.1	0.5	0.035 U	0.044 U	0.044 U	0.034 U	0.036 U		0.035 U	0.034 U	0.036 U	0.034 U
Aroclor-1242	2.1	0.5	0.035 U	0.044 U	0.044 U	0.034 U	0.036 U	*** 10 DJ**	0.035 U	0.034 U	0.036 U	0.034 U
Aroclor-1248	2.1	0.5	0.035 U	0.044 U	0.044 U	0.034 U	0.036 U		0.035 U	0.034 U	0.036 U	0.034 U
Aroclor-1254	2.1	0.5	0.035 U	0.044 U	0.044 U	0.034 U	0.036 U	**1.8 DJ**	0.035 U	0.034 U	0.036 U	0.034 U
Aroclor-1260	2.1	0.5	0.035 U	0.044 U	0.044 U	0.034 U	0.41 J	**0.58 J**	0.035 U	0.034 U	0.036 U	0.034 U
beta-BHC	2.1	0.6	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0019 U		0.0018 U	0.0017 U	0.0019 U	0.0017 U
delta-BHC	420	22	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0019 U		0.0018 U	0.0017 U	0.0019 U	0.0017 U
Dieldrin	0.3	0.07	0.0042	0.0044 U	0.0044 U	0.0034 U	0.0056 J		0.0035 U	0.0034 U	0.0036 U	0.0034 U
Endosulfan I	6700	410	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0019 U		0.0018 U	0.0017 U	0.0019 U	0.0017 U
Endosulfan II	6700	410	0.0035 U	0.0044 U	0.0044 U	0.0034 U	0.0085 J		0.0035 U	0.004 J	0.0036 U	0.0034 U
Endosulfan sulfate	6700	410	0.0035 U	0.0044 U	0.0044 U	0.0034 U	0.0036 U		0.0035 U	0.0034 U	0.0036 U	0.0034 U
Endrin	340	21	0.0035 U	0.0044 U	0.0044 U	0.0034 U	0.0036 UJ		0.0035 U	0.0034 U	0.0036 U	0.0034 U
Endrin aldehyde	340	21	0.0035 U	0.0044 U	0.0044 U	0.0034 U	0.0036 U		0.0035 U	0.0034 U	0.0036 U	0.0034 U
Endrin ketone	340	21	0.0035 U	0.0044 U	0.0044 U	0.0034 U	0.0036 U		0.0035 U	0.0034 U	0.0036 U	0.0034 U
(Lindane)	2.2	0.7	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0019 U		0.0018 U	0.0017 U	0.0019 U	0.0017 U
gamma-Chlordane	12	3.1	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0039 J		0.0018 U	0.0017 U	0.0019 U	0.0017 U
Heptachlor	0.9	0.2	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.004 U		0.0018 U	0.0017 U	0.0019 U	0.0017 U
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0023 U	0.0023 U	0.0017 U	0.0019 U		0.0018 U	0.0017 U	0.0019 U	0.0017 U
Methoxychlor	7500	370	0.018 U	0.023 U	0.023 U	0.017 U	0.019 U		0.018 U	0.017 U	0.019 U	0.017 U
Toxaphene	3.7	1	0.18 U	0.23 U	0.23 U	0.17 U	0.19 U			0.17 U	0.19 U	0.17 U

Table B-4: Summary of Surface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S014301	030S014501	030S014701	030S014901	030S015001	030S015002	030S015101	030S015302	030S015402
4,4'-DDD	18	4.6	0.0035 U	0.0034 U	0.0034 U	0.0035 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0036 U
4,4'-DDE	13	3.3	0.0035 UJ	0.0034 U	0.0034 U	0.0035 U	0.034	0.0034 U	0.0036 U	0.0036 U	0.0036 U
4,4'-DDT	13	3.3	0.0035 U	0.0034 UJ	0.0034 U	0.0035 U	0.023	0.0034 U	0.0036 U	0.0036 U	0.0057 J
Aldrin	0.3	0.07	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0023	0.0017 U	0.0018 U	0.0018 U	0.0018 U
alpha-BHC	0.5	0.2	0.0018 U	0.0017 UJ	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U
alpha-Chlordane	12	3.1	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0028 J
Aroclor-1016	2.1	0.5	0.035 U	0.034 U	0.034 U	0.035 U	0.034 U	0.034 U	0.036 U	0.036 U	0.011 J
Aroclor-1221	2.1	0.5	0.072 U	0.068 U	0.07 U	0.07 U	0.069 U	0.069 U	0.073 U	0.072 U	0.073 U
Aroclor-1232	2.1	0.5	0.035 U	0.034 U	0.034 U	0.035 U	0.034 U	0.034 U	0.036 U	0.036 U	0.036 U
Aroclor-1242	2.1	0.5	0.035 U	0.034 U	0.034 U	0.035 U	0.034 U	0.034 U	0.036 U	0.036 U	0.036 U
Aroclor-1248	2.1	0.5	0.035 U	0.034 U	0.034 U	0.035 U	0.034 U	0.034 U	0.036 U	0.036 U	0.036 U
Aroclor-1254	2.1	0.5	0.035 U	0.034 U	0.034 U	0.035 U	0.034 U	0.034 U	0.036 U	0.036 U	0.036 U
Aroclor-1260	2.1	0.5	0.035 U	0.034 U	0.034 U	0.035 U	0.047	0.034 U	0.084	0.036 U	0.045 J
beta-BHC	2.1	0.6	0.0018 U	0.0017 UJ	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U
delta-BHC	420	22	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U
Dieldrin	0.3	0.07	0.0035 U	0.0034 U	0.0034 U	0.0035 U	0.0034 U	0.0034 U	0.0059	0.0036 U	0.064 DJ
Endosulfan I	6700	410	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U
Endosulfan II	6700	410	0.0035 U	0.0034 U	0.0034 U	0.0035 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0036 U
Endosulfan sulfate	6700	410	0.0035 U	0.0034 U	0.0034 U	0.0035 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0036 U
Endrin	340	21	0.0035 U	0.0034 UJ	0.0034 U	0.0035 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0036 U
Endrin aldehyde	340	21	0.0035 U	0.0034 U	0.0034 U	0.0035 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0036 U
Endrin ketone	340	21	0.0035 U	0.0034 U	0.0034 U	0.0035 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0036 U
(Lindane)	2.2	0.7	0.0018 U	0.0017 UJ	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane	12	3.1	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.014 J
Heptachlor	0.9	0.2	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0037 J
Heptachlor epoxide	0.4	0.1	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U	0.0017 U	0.0018 U	0.0018 U	0.0049 J
Methoxychlor	7500	370	0.018 U	0.017 U	0.018 U	0.018 U	0.018 U	0.017 U	0.018 U	0.018 U	0.018 U
Toxaphene	3.7	1	0.18 U	0.17 U	0.18 U	0.18 U	0.18 U	0.17 U	0.18 U	0.18 U	0.18 U

Table B-5: Summary of Subsurface Soil Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	Leachability Based SCTL	012S000315		012S000814		030S012304	
		1993	2003	1993	2003	1993	2003
4,4'-DDD	4000	3.5 U	0.37 U	240 CPE	0.36 U	3.4 U	0.37 U
4,4'-DDE	18000	3.7	0.57 U	22	8.7	3.4 U	0.57 U
4,4'-DDT	11000	4	0.33 U	3.4 U	14	3.4 U	0.33 U
Aldrin	500	1.8 U	0.12 U	1.7 U	0.11 U	1.8 U	0.12 U
alpha-BHC	0.30	1.8 U	0.25 U	1.7 U	0.25 U	1.8 U	0.26 U
alpha-Chlordane	9600	0.71 J	0.12 U	1.7 U	0.11 U	1.8 U	0.12 U
Aroclor-1016	17000	35 U	4.1 U	34 U	4.1 U	34 U	4.1 U
Aroclor-1221	17000	35 U	18 U	34 U	18 U	70 U	18 U
Aroclor-1232	17000	35 U	7 U	34 U	7 U	34 U	7.1 U
Aroclor-1242	17000	35 U	7 U	34 U	7 U	34 U	7.1 U
Aroclor-1248	17000	35 U	6.8 U	34 U	6.8 U	34 U	6.9 U
Aroclor-1254	17000	71 U	7 U	69 U	7 U	34 U	7.1 U
Aroclor-1260	17000	120	4.6 U	260	120	34 U	4.7 U
beta-BHC	1	1.8 U	0.3 U	1.7 U	0.3 U	1.8 U	0.31 U
delta-BHC	200	1.8 U	0.13 U	1.7 U	0.12 U	1.8 U	0.13 U
Dieldrin	4	1.6 J	0.33 U	3.4 U	1.6 J	**17**	0.33 P
Endosulfan I	3800	1.8 U	0.18 U	1.7 U	0.18 U	1.8 U	0.18 U
Endosulfan II	3800	3 J	0.23 U	3.4 U	0.23 U	3.4 U	0.23 U
Endosulfan sulfate	NA	3.5 U	0.46 U	3.4 U	0.46 U	3.4 U	0.47 U
Endrin	1000	3.5 U	0.45 U	3.4 U	0.45 U	3.4 U	0.46 U
Endrin aldehyde	NA	4.6	0.33 U	3.4 U	0.32 U	3.4 U	0.33 U
Endrin ketone	NA	3.5 U	0.4 U	3.4 U	0.4 U	3.4 U	0.4 U
gamma-BHC (Lindane)	9	1.8 U	0.16 U	1.7 U	0.16 U	1.8 U	0.16 U
gamma-Chlordane	9600	0.99 J	0.14 U	1.7 U	0.14 U	1.8 U	0.14 U
Heptachlor	23000	1.8 U	0.29 U	1.7 U	0.29 U	1.8 U	0.3 U
Heptachlor epoxide	600	1.8 U	0.18 U	1.7 U	0.18 U	1.8 U	0.18 U
Methoxychlor	160000	18 U	0.21 U	17 U	0.21 U	18 U	0.21 U
Toxaphene	31000	180 U	35 U	170 U	34 U	180 U	35 U

Notes:
All concentrations expressed in micrograms per kilogram
Leachability SCTLs are based on groundwater
Bolding indicates an exceedance of the SCTL.
C - compound has been qualitatively confirmed by GC/MS
E - reported value exceeds the calibration range of the instrument
J - present below the method detection limit but above the instrument detection limit
P - percent difference between results from two analytical columns is >25%
U - not detected
Aroclors were compared with the PCB aroclor mixture SCTL
Alpha- and gamma-chlordane were compared with the Chlordane SCTL
Endosulfan I, Endosulfan II, and Endosulfan sulfate were compared with the Endosulfan SCTL
Endrin aldehyde and Endrin ketone were compared with the Endrin SCTL

Table B-6: Summary of Groundwater Pesticides/PCBs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	012GS008		030GS123		
				1993	2003	1993	1995	2003
4,4'-DDD	0.2	0.0003	0.0003	0.11	0.016 U	0.1 U	0.1 U	0.016 U
4,4'-DDE	0.1	0.0002	0.0002	0.0039 J	0.01 U	0.1 U	0.1 U	0.01 U
4,4'-DDT	0.1	0.00059	0.00059	0.0099 J	0.014 U	0.1 U	0.1 U	0.014 U
Aldrin	0.002	0.00014	0.00014	0.05 U	0.0086 U	0.048 U	0.05 U	0.0086 U
alpha-BHC	0.006	0.005	0.005	na	0.0035 U	0.048 U	0.05 U	0.0035 U
alpha-Chlordane	2.0	0.00059	0.00059	0.05 J	0.0084 U	0.048 U	0.05 U	0.0084 U
Aroclor-1016	0.5	0.000045	0.000045	1 U	0.11 U	0.96 U		0.11 U
Aroclor-1221	0.5	0.000045	0.000045	2 U	0.5 U	1.96 U		0.5 U
Aroclor-1232	0.5	0.000045	0.000045	1 U	0.18 U	0.96 U		0.18 U
Aroclor-1242	0.5	0.000045	0.000045	1 U	0.14 U	0.96 U		0.14 U
Aroclor-1248	0.5	0.000045	0.000045	1 U	0.11 U	0.96 U		0.11 U
Aroclor-1254	0.5	0.000045	0.000045	1 U	0.2 U	0.96 U		0.2 U
Aroclor-1260	0.5	0.000045	0.000045	0.42 J	0.11 U	0.96 U		0.11 U
beta-BHC	0.02	0.046	0.046	0.05 U	0.0035 U	0.048 U	0.05 U	0.0035 U
delta-BHC	2.3	NA	NA	0.05 U	0.009 U	0.048 U	0.05 U	0.009 U
Dieldrin	0.0020	0.00014	0.00014	0.1 U	0.006 U	0.1 U	0.1 U	0.006 U
Endosulfan I	46.0	0.056	0.0087	0.05 U	0.0099 U	0.048 U	0.05 U	0.0099 U
Endosulfan II	46.0	0.056	0.0087	0.1 U	0.0084 U	0.1 U	0.1 U	0.0084 U
Endosulfan sulfate	46.0	0.056	0.0087	0.1 U	0.0085 U	0.1 U	0.1 U	0.0085 U
Endrin	2.0	0.0023	0.0023	0.1 U	0.0097 U	0.1 U	0.1 U	0.0097 U
Endrin aldehyde	0.2	NA	NA	0.014 J	0.014 U	0.1 U	0.1 U	0.014 U
Endrin ketone	0.2	NA	NA	0.1 U	0.0072 U	0.1 U	0.1 U	0.0072 U
gamma-BHC (Lindane)	0.2	0.063	0.063	0.05 U	0.003 U	0.048 U	0.05 U	0.003 U
gamma-Chlordane	2.0	0.00059	0.00059	0.05 U	0.007 U	0.048 U	0.05 U	0.007 U
Heptachlor	0.4	0.00021	0.00021	0.05 U	0.0014 U	0.048 U	0.05 U	0.0014 U
Heptachlor epoxide	0.2	0.00004	0.00004	0.05 U	0.0026 U	0.048 U	0.05 U	0.0026 U
Methoxychlor	40.0	0.03	0.03	0.5 U	0.007 U	0.48 U	0.05 U	0.007 U
Toxaphene	3.0	0.0002	0.0002	5 U	0.77 U	**4.8**	3 U	0.77 U

Notes:
All concentrations expressed in micrograms per kilogram
Bolding indicates an exceedance of CTL.
J - present below the method detection limit but above the instrument detection limit
U - not detected
NA - not analyzed
Aroclors were compared with the PCB aroclor mixture CTLs
Alpha- and gamma-chlordane were compared with the Chlordane CTLs
Endosulfan I, Endosulfan II, and Endosulfan sulfate were compared with the Endosulfan CTLs
Endrin aldehyde and Endrin ketone were compared with the Endrin CTLs

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SI00602	011SI01501	011SRA0101	011SRA0201	011SRA0301	011SRA0401	011SRA0501	011SRA0601	011SRA0701
1,2,4-Trichlorobenzene	7500	560	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
1,2-Dichlorobenzene	4600	650	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
1,3-Dichlorobenzene	180	27	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
1,4-Dichlorobenzene	9	6	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2,4,5-Trichlorophenol	82000	6000	0.8 U	1.7 U	1.6 UJ	0.81 U	0.82 U	0.81 U	4.8 U	4.5 U	4.4 U
2,4,6-Trichlorophenol	180	72	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2,4-Dichlorophenol	1300	130	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2,4-Dimethylphenol	9800	910	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2,4-Dinitrophenol	620	66	0.8 UJ		1.6 U	0.81 U	0.82 U	0.81 U	4.8 UJ	4.5 UJ	4.4 U
2,4-Dinitrotoluene	3.7	1.3	0.33 U	0.69 UJ	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2,6-Dinitrotoluene	2.1	1	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2-Chloronaphthalene	49000	4000	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2-Chlorophenol	640	82	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2-Methyl-4,6-Dinitrophenol	na	na	0.8 U	1.7 UJ	1.6 U	0.81 U	0.82 U	0.81 U	4.8 U	4.5 U	4.4 U
2-Methylnaphthalene	560	80	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
2-Methylphenol (o-Cresol)	28000	2400	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 UJ	1.8 UJ	1.8 U
2-Nitroaniline	66	5.7	0.8 UJ	1.7 U	1.6 U	0.81 U	0.82 U	0.81 U	4.8 U	4.5 U	4.4 U
2-Nitrophenol	na	na	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
3,3'-Dichlorobenzidine	6.3	2.1	0.33 U	0.69 UJ	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	3.6 U
3-Nitroaniline	na	na	0.8 U	1.7 U	1.6 U	0.81 UJ	0.82 UJ	0.81 UJ	4.8 U	4.5 U	4.4 U
4-Bromophenyl-phenylether	na	na	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
4-Chloro-3-methylphenol	4400	410	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
4-Chloroaniline	2000	190	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
4-Chlorophenylphenyl ether	na	na	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
4-Methylphenol (p-Cresol)	3000	250	0.33 UJ	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
4-Nitroaniline	56	5.2	0.8 UJ	1.7 UJ	1.6 U	0.81 UJ	0.82 UJ	0.81 UJ	4.8 UJ	4.5 UJ	4.4 U
4-Nitrophenol	4400	390	0.8 U	1.7 U	1.6 U	0.81 U	0.82 U	0.81 U	4.8 U	4.5 U	4.4 U
Acenaphthene	18000	1900	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.4 J
Acenaphthylene	11000	1100	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	0.22 J
Anthracene	260000	18000	0.33 U	0.69 UJ	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.6 J
Benzo(a)anthracene	5	1.4	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	0.22 J	1.8 U	**4.6**
Benzo(a)pyrene	0.5	0.1	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	*** 4.5**
Benzo(b)fluoranthene	4.8	1.4	0.33 U	0.69 U	0.67 UJ	0.33 U	0.34 U	0.33 U	0.52 J	1.8 U	*** 5.2**

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SI00602	011SI01501	011SRA0101	011SRA0201	011SRA0301	011SRA0401	011SRA0501	011SRA0601	011SRA0701
Benzo(g,h,i)perylene	41000	2300	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	2.4
Benzo(k)fluoranthene	52	15	0.33 UJ	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 UJ	1.8 UJ	3.4
bis(2-Chloroethoxy)methane	na	na	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
bis(2-Chloroethyl)ether	0.4	0.3	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.33 UJ	0.69 U	0.67 UJ	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
(BEHP)	280	76	0.047 J	0.69 UJ	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Butylbenzylphthalate	320000	15000	0.33 U	0.69 U	0.67 UJ	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Carbazole	190	53	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	0.82 J
Chrysene	450	140	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	4.8
Dibenz(a,h)anthracene	0.5	0.1	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	*** 1.2 J**
Dibenzofuran	5000	280	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	0.38 J
Diethylphthalate	920000	54000	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Dimethylphthalate	na	590000	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Di-n-butylphthalate	140000	7300	0.33 U	0.69 UJ	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Di-n-octylphthalate	27000	1500	0.33 U	0.69 UJ	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Fluoranthene	48000	2900	0.33 U	0.13 J	0.67 U	0.33 U	0.34 U	0.33 U	0.47 J	1.8 U	9.1
Fluorene	28000	2200	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	0.9 J
Hexachlorobenzene	1.1	0.5	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Hexachlorobutadiene	12	6.3	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Hexachlorocyclopentadiene	16	2.4	0.33 U	0.69 UJ	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Hexachloroethane	78	34	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 UJ	1.8 UJ	1.8 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	**2.4**
Isophorone	580	340	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Naphthalene	270	40	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	0.43 J
Nitrobenzene	120	14	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.33 UJ	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
N-Nitrosodiphenylamine	440	170	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Pentachlorophenol	23	7.7	0.8 U	1.7 U	1.6 U	0.81 U	0.82 U	0.81 U	4.8 U	4.5 U	4.4 U
Phenanthrene	30000	2000	0.33 U	0.089 J	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	6.9
Phenol	390000	900	0.33 U	0.69 U	0.67 U	0.33 U	0.34 U	0.33 U	2 U	1.8 U	1.8 U
Pyrene	37000	2200	0.33 U	0.11 J	0.67 U	0.33 U	0.34 U	0.33 U	0.5 J	1.8 U	8

Notes:
All concentrations expressed in milligrams per kilogram
* Indicates the value exceeds the C/I direct exposure SCTL.
Bolding indicates the value exceeds the residential direct exposure SCTL.
Blank cells indicate that the sample was not collected or analyzed for that parameter
na - not analyzed
U - not detected
J - present below the method detection limit but above the instrument detection limit

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SRA0801	011SRA0901	011SRA1001	011SRA1101 9/9/1993	011SRA1201	011SRA1301	011SS00101	011SS00301
1,2,4-Trichlorobenzene	7500	560	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
1,2-Dichlorobenzene	4600	650	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
1,3-Dichlorobenzene	180	27	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
1,4-Dichlorobenzene	9	6	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2,4,5-Trichlorophenol	82000	6000	4.3 U	0.86 U	0.82 U	0.82 U	130 U	4.3 U	1.6 U	0.85 U
2,4,6-Trichlorophenol	180	72	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2,4-Dichlorophenol	1300	130	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2,4-Dimethylphenol	9800	910	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2,4-Dinitrophenol	620	66	4.3 U	0.86 U	0.82 U	0.82 UJ	130 UJ	4.3 UJ	1.6 UJ	0.85 UJ
2,4-Dinitrotoluene	3.7	1.3	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2,6-Dinitrotoluene	2.1	1	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2-Chloronaphthalene	49000	4000	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2-Chlorophenol	640	82	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2-Methyl-4,6-Dinitrophenol	na	na	4.3 U	0.86 U	0.82 U	0.82 UJ	130 UJ	4.3 U	1.6 U	0.85 U
2-Methylnaphthalene	560	80	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
2-Methylphenol (o-Cresol)	28000	2400	1.8 U	0.36 UJ	0.34 U	0.34 U	53 U	1.8 UJ	0.68 U	0.35 U
2-Nitroaniline	66	5.7	4.3 U	0.86 U	0.82 U	0.82 U	130 U	4.3 U	1.6 UJ	0.85 UJ
2-Nitrophenol	na	na	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
3,3'-Dichlorobenzidine	6.3	2.1	3.5 U	0.36 U	0.34 U	0.34 U	53 UJ	1.8 U	0.68 U	0.35 U
3-Nitroaniline	na	na	4.3 U	0.86 UJ	0.82 UJ	0.82 U	130 U	4.3 U	1.6 UJ	0.85 UJ
4-Bromophenyl-phenylether	na	na	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
4-Chloro-3-methylphenol	4400	410	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
4-Chloroaniline	2000	190	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
4-Chlorophenylphenyl ether	na	na	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 UJ	0.35 UJ
4-Methylphenol (p-Cresol)	3000	250	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
4-Nitroaniline	56	5.2	4.3 U	0.86 UJ	0.82 UJ	0.82 U	130 U	4.3 UJ	1.6 UJ	0.85 UJ
4-Nitrophenol	4400	390	4.3 U	0.86 U	0.82 U	0.82 U	130 U	4.3 U	1.6 UJ	0.85 UJ
Acenaphthene	18000	1900	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Acenaphthylene	11000	1100	0.26 J	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Anthracene	260000	18000	1.8 U	0.36 U	0.34 U	0.34 U	53 U	0.32 J	0.13 J	0.04 J
Benzo(a)anthracene	5	1.4	0.46 J	0.045 J	0.34 U	0.34 U	53 U	0.66 J	0.4 J	0.14 J
Benzo(a)pyrene	0.5	0.1	* **0.61 J**	0.05 J	0.34 U	0.34 U	53 U	1.8 U	**0.29 J**	0.085 J
Benzo(b)fluoranthene	4.8	1.4	0.83 J	0.066 J	0.34 U	0.34 U	53 U	1.3 J	0.4 J	0.13 J

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SRA0801	011SRA0901	011SRA1001	011SRA1101 9/9/1993	011SRA1201	011SRA1301	011SS00101	011SS00301
Benzo(g,h,i)perylene	41000	2300	0.52 J	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Benzo(k)fluoranthene	52	15	0.52 J	0.055 J	0.34 U	0.34 U	53 UJ	1.8 UJ	0.34 J	0.15 J
bis(2-Chloroethoxy)methane	na	na	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
bis(2-Chloroethyl)ether	0.4	0.3	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	1.8 U	0.36 UJ	0.34 U	0.34 U	53 U	1.8 U	0.68 UJ	0.35 UJ
(BEHP)	280	76	2.1 U	0.22 U	0.34 U	0.34 UJ	53 UJ	1.8 U	0.68 U	0.35 U
Butylbenzylphthalate	320000	15000	1.8 U	0.36 U	0.34 U	0.34 UJ	53 UJ	1.8 U	0.68 U	0.35 U
Carbazole	190	53	1.8 U	0.36 U	0.34 UJ	0.34 U	53 UJ	1.8 U	0.11 J	0.35 U
Chrysene	450	140	0.62 J	0.05 J	0.34 U	0.34 U	53 U	0.83 J	0.47 J	0.16 J
Dibenz(a,h)anthracene	0.5	0.1	**0.21 J**	0.36 U	0.34 U	0.34 U	53 UJ	1.8 U	0.68 U	0.35 U
Dibenzofuran	5000	280	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Diethylphthalate	920000	54000	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Dimethylphthalate	na	590000	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Di-n-butylphthalate	140000	7300	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Di-n-octylphthalate	27000	1500	1.8 U	0.36 U	0.34 U	0.34 UJ	53 UJ	1.8 U	0.68 U	0.35 U
Fluoranthene	48000	2900	0.87 J	0.072 J	0.34 U	0.34 U	53 U	1.8	1.1	0.31 J
Fluorene	28000	2200	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Hexachlorobenzene	1.1	0.5	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Hexachlorobutadiene	12	6.3	1.8 U	0.36 UJ	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Hexachlorocyclopentadiene	16	2.4	1.8 U	0.36 U	0.34 U	0.34 UJ	53 UJ	1.8 U	0.68 U	0.35 U
Hexachloroethane	78	34	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 UJ	0.68 U	0.35 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.46 J	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Isophorone	580	340	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Naphthalene	270	40	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.082 J	0.35 U
Nitrobenzene	120	14	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
N-Nitroso-di-n-propylamine	0.2	0.09	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
N-Nitrosodiphenylamine	440	170	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Pentachlorophenol	23	7.7	4.3 U	0.86 U	0.82 U	0.82 U	130 U	4.3 U	1.6 U	0.85 U
Phenanthrene	30000	2000	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.7 J	0.77	0.26 J
Phenol	390000	900	1.8 U	0.36 U	0.34 U	0.34 U	53 U	1.8 U	0.68 U	0.35 U
Pyrene	37000	2200	0.74 J	0.08 J	0.34 U	0.34 U	53 U	1.5 J	0.84	0.25 J

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SS01101	011SS01301	012S000201	012S000301	012S000401	012S000501	012S000601	012S000701	012S000801
1,2,4-Trichlorobenzene	7500	560	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
1,2-Dichlorobenzene	4600	650	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
1,3-Dichlorobenzene	180	27	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
1,4-Dichlorobenzene	9	6	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	8.7 U	4.5 U	0.86 U	2.6 U	0.86 U	0.85 U	0.86 U	0.88 U	0.85 U
2,4,6-Trichlorophenol	180	72	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2,4-Dichlorophenol	1300	130	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2,4-Dimethylphenol	9800	910	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2,4-Dinitrophenol	620	66		4.5 UJ	0.86 U	2.6 U	0.86 U	0.85 U	0.86 U	0.88 U	0.85 U
2,4-Dinitrotoluene	3.7	1.3	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2,6-Dinitrotoluene	2.1	1	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2-Chloronaphthalene	49000	4000	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2-Chlorophenol	640	82	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na		4.5 U	0.86 U	2.6 U	0.86 U	0.85 U	0.86 U	0.88 U	0.85 U
2-Methylnaphthalene	560	80	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	3.6 U	1.9 U	0.34 U	1 UJ	0.34 U	0.34 UJ	0.34 U	0.35 U	0.34 U
2-Nitroaniline	66	5.7	8.7 U	4.5 UJ	0.86 UJ	2.6 UJ	0.86 UJ	0.85 UJ	0.86 U	0.88 U	0.85 U
2-Nitrophenol	na	na	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	7.2 U	1.9 U	0.34 UJ	1 U	0.34 UJ	0.34 U	0.34 U	0.35 U	0.34 U
3-Nitroaniline	na	na	8.7 U	4.5 U	0.86 U	2.6 U	0.86 U	0.85 U	0.86 U	0.88 UJ	0.85 U
4-Bromophenyl-phenylether	na	na	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
4-Chloro-3-methylphenol	4400	410	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
4-Chloroaniline	2000	190	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 UJ	0.35 U	0.34 U
4-Chlorophenylphenyl ether	na	na	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 UJ	0.35 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
4-Nitroaniline	56	5.2	8.7 U	4.5 UJ	0.86 U	2.6 U	0.86 U	0.85 U	0.86 U	0.88 U	0.85 U
4-Nitrophenol	4400	390	8.7 U	4.5 U	0.86 U	2.6 U	0.86 U	0.85 U	0.86 U	0.88 U	0.85 U
Acenaphthene	18000	1900	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Acenaphthylene	11000	1100	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.07 J	0.075 J
Anthracene	260000	18000	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Benzo(a)anthracene	5	1.4	3.6 U	1.9 U	0.1 J	0.11 J	0.051 J	0.056 J	0.036 J	0.34 J	0.35
Benzo(a)pyrene	0.5	0.1	3.6 U	1.9 U	0.066 J	1 U	0.34 U	0.054 J	0.34 U	**0.34 J**	**0.36**
Benzo(b)fluoranthene	4.8	1.4	3.6 U	1.9 U	0.23 J	0.18 J	0.097 J	0.12 J	0.08 J	0.74 J	0.9

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SS01101	011SS01301	012S000201	012S000301	012S000401	012S000501	012S000601	012S000701	012S000801
Benzo(g,h,i)perylene	41000	2300	3.6 U	1.9 U	0.34 UJ	1 U	0.34 UJ	0.34 U	0.34 UJ	0.19 J	0.23 J
Benzo(k)fluoranthene	52	15	3.6 U	1.9 U	0.23 J	0.21 J	0.099 J	0.13 J	0.089 J	0.96 J	0.91
bis(2-Chloroethoxy)methane	na	na	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	3.6 U	1.9 UJ	0.34 UJ	1 UJ	0.34 UJ	0.34 UJ	0.34 U	0.35 U	0.34 U
(BEHP)	280	76	3.6 U	1.9 U	0.34 UJ	4.8 J	0.34 UJ	0.34 UJ	0.16 J	0.28 J	0.097 J
Butylbenzylphthalate	320000	15000	3.6 U	1.9 U	0.34 UJ	0.26 J	0.044 J	0.34 UJ	0.079 J	0.05 J	0.041 J
Carbazole	190	53	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 UJ	0.35 U	0.34 U
Chrysene	450	140	3.6 U	1.9 U	0.12 J	1 U	0.059 J	0.063 J	0.044 J	0.28 J	0.42
Dibenz(a,h)anthracene	0.5	0.1	3.6 U	1.9 U	0.34 UJ	1 U	0.34 UJ	0.34 U	0.34 U	0.045 J	0.059 J
Dibenzofuran	5000	280	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Diethylphthalate	920000	54000	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Dimethylphthalate	na	590000	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Di-n-butylphthalate	140000	7300	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.03 J
Di-n-octylphthalate	27000	1500	3.6 U	1.9 U	0.34 UJ	1 UJ	0.34 UJ	0.34 UJ	0.34 U	0.35 U	0.34 U
Fluoranthene	48000	2900	3.6 U	1.9 U	0.18 J	0.12 J	0.061 J	0.073 J	0.05 J	0.38	0.34
Fluorene	28000	2200	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Hexachlorobenzene	1.1	0.5	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Hexachlorobutadiene	12	6.3	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 UJ	0.35 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 UJ	0.35 U	0.34 U
Hexachloroethane	78	34	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.17 J	0.21 J
Isophorone	580	340	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Naphthalene	270	40	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Nitrobenzene	120	14	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	3.6 U	1.9 U	0.34 UJ	1 UJ	0.34 UJ	0.34 UJ	0.34 U	0.35 U	0.34 U
N-Nitrosodiphenylamine	440	170	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Pentachlorophenol	23	7.7	8.7 UJ	4.5 U	0.86 U	2.6 U	0.86 U	0.85 U	0.86 U	0.88 U	0.85 U
Phenanthrene	30000	2000	3.6 U	1.9 U	0.16 J	1 U	0.046 J	0.34 U	0.34 U	0.062 J	0.07 J
Phenol	390000	900	3.6 U	1.9 U	0.34 U	1 U	0.34 U	0.34 U	0.34 U	0.35 U	0.34 U
Pyrene	37000	2200	3.6 U	1.9 U	0.18 J	0.13 J	0.07 J	0.071 J	0.052 J	0.27 J	0.4

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	012S000901	012S001001	012S001101	012S001201	012S001301	012S001401	012S001501	012S001601	025S000100
1,2,4-Trichlorobenzene	7500	560	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
1,2-Dichlorobenzene	4600	650	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
1,3-Dichlorobenzene	180	27	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
1,4-Dichlorobenzene	9	6	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
2,4,5-Trichlorophenol	82000	6000	0.88 U	0.89 U	0.93 U	1.8 U	0.86 U	0.87 U	0.85 U	0.85 U	0.8 U
2,4,6-Trichlorophenol	180	72	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
2,4-Dichlorophenol	1300	130	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
2,4-Dimethylphenol	9800	910	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.16 J	0.18 J	0.33 U
2,4-Dinitrophenol	620	66	0.88 U	0.89 U	0.93 U	1.8 U	0.9 U	0.91 U	0.89 U	0.88 U	0.8 U
2,4-Dinitrotoluene	3.7	1.3	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
2,6-Dinitrotoluene	2.1	1	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
2-Chloronaphthalene	49000	4000	0.039 J	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
2-Chlorophenol	640	82	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
2-Methyl-4,6-Dinitrophenol	na	na	0.88 U	0.89 U	0.93 U	1.8 U	0.9 U	0.91 U	0.89 U	0.88 U	0.8 U
2-Methylnaphthalene	560	80	0.35 U	0.35 U	0.37 U	0.082 J	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
2-Methylphenol (o-Cresol)	28000	2400	0.35 U	0.35 U	0.37 U	0.7 U	0.36 UJ	0.36 U	0.16 J	0.047 J	0.33 U
2-Nitroaniline	66	5.7	0.88 U	0.89 U	0.93 U	1.8 U	0.9 UJ	0.91 U	0.89 U	0.88 U	0.8 U
2-Nitrophenol	na	na	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
3,3'-Dichlorobenzidine	6.3	2.1	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
3-Nitroaniline	na	na	0.88 U	0.89 U	0.93 U	1.8 U	0.9 U	0.91 U	0.89 U	0.88 U	0.8 U
4-Bromophenyl-phenylether	na	na	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
4-Chloro-3-methylphenol	4400	410	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
4-Chloroaniline	2000	190	0.35 UJ	0.35 U	0.37 UJ	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
4-Chlorophenylphenyl ether	na	na	0.35 UJ	0.35 U	0.37 UJ	0.7 UJ	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
4-Methylphenol (p-Cresol)	3000	250	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.29 J	0.092 J	0.33 U
4-Nitroaniline	56	5.2	0.88 U	0.89 U	0.93 U	1.8 U	0.9 U	0.91 U	0.89 U	0.88 U	0.8 U
4-Nitrophenol	4400	390	0.88 U	0.89 U	0.93 U	1.8 U	0.9 U	0.91 U	0.89 U	0.88 U	0.8 U
Acenaphthene	18000	1900	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.056 J	0.35 U	0.33 U
Acenaphthylene	11000	1100	0.47	0.27 J	0.057 J	0.085 J	0.36 U	0.36 U	0.35 U	0.22 J	0.33 U
Anthracene	260000	18000	0.12 J	0.09 J	0.37 U	0.7 U	0.36 U	0.36 U	0.069 J	0.05 J	0.33 U
Benzo(a)anthracene	5	1.4	1.2	**1.5**	0.15 J	0.12 J	0.095 J	0.36 U	0.17 J	0.44	0.16 J
Benzo(a)pyrene	0.5	0.1	*** 1**	*** 1.9**	**0.18 J**	**0.14 J**	**0.12 J**	0.36 U	**0.19 J**	*** 0.7**	0.081 J
Benzo(b)fluoranthene	4.8	1.4	**3.6 J**	**4.5 J**	0.47 J	0.32 J	0.27 J	0.055 J	0.41	0.94	0.25 J

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	012S000901	012S001001	012S001101	012S001201	012S001301	012S001401	012S001501	012S001601	025S000100
Benzo(g,h,i)perylene	41000	2300	1.6 J	0.87	0.22 J	0.22 J	0.13 J	0.36 U	0.24 J	1	0.12 J
Benzo(k)fluoranthene	52	15	3.3 J	3.3 J	0.43 J	0.42 J	0.25 J	0.054 J	0.41	0.41	0.25 J
bis(2-Chloroethoxy)methane	na	na	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
bis(2-Chloroethyl)ether	0.4	0.3	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.35 U	0.35 U	0.37 U	0.7 U	0.36 UJ	0.36 U	0.35 U	0.35 U	0.33 U
(BEHP)	280	76	0.13 J	0.06 J	0.086 J	0.7 U	0.36 UJ	0.023 J	0.45	0.065 J	0.33 U
Butylbenzylphthalate	320000	15000	0.65 J	0.35 U	0.37 UJ	0.7 U	0.36 UJ	0.36 U	0.27 J	0.35 U	0.33 U
Carbazole	190	53	0.14 J	0.05 J	0.37 UJ	0.086 J	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Chrysene	450	140	0.93	1.5	0.11 J	0.18 J	0.096 J	0.36 U	0.2 J	0.47	0.13 J
Dibenz(a,h)anthracene	0.5	0.1	0.053 J	**0.23 J**	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	**0.19 J**	0.33 U
Dibenzofuran	5000	280	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Diethylphthalate	920000	54000	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Dimethylphthalate	na	590000	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.19 J	0.35 U	0.33 U
Di-n-butylphthalate	140000	7300	0.35 U	0.61	0.37 U	0.7 U	0.36 U	0.36 U	0.075 J	0.17 J	0.33 U
Di-n-octylphthalate	27000	1500	0.35 U	0.35 U	0.37 U	0.7 U	0.36 UJ	0.36 U	0.35 U	0.35 U	0.33 U
Fluoranthene	48000	2900	1.2	1.9	0.13 J	0.37 J	0.17 J	0.36 U	0.49	0.56	0.31 J
Fluorene	28000	2200	0.039 J	0.35 U	0.37 U	0.096 J	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Hexachlorobenzene	1.1	0.5	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Hexachlorobutadiene	12	6.3	0.35 UJ	0.35 U	0.37 UJ	0.7 U	0.36 UJ	0.36 U	0.35 U	0.35 U	0.33 U
Hexachlorocyclopentadiene	16	2.4	0.35 UJ	0.35 U	0.37 UJ	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Hexachloroethane	78	34	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	1.3	0.82	0.11 J	0.15 J	0.11 J	0.36 U	0.16 J	0.84	0.13 J
Isophorone	580	340	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Naphthalene	270	40	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Nitrobenzene	120	14	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.35 U	0.35 U	0.37 U	0.7 U	0.36 UJ	0.36 U	0.35 U	0.35 U	0.33 U
N-Nitrosodiphenylamine	440	170	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Pentachlorophenol	23	7.7	0.88 U	0.89 U	0.93 U	1.8 U	0.9 U	0.91 U	0.89 U	0.88 U	0.8 U
Phenanthrene	30000	2000	0.34 J	0.21 J	0.37 U	0.38 J	0.074 J	0.36 U	0.27 J	0.12 J	0.2 J
Phenol	390000	900	0.35 U	0.35 U	0.37 U	0.7 U	0.36 U	0.36 U	0.35 U	0.35 U	0.33 U
Pyrene	37000	2200	1.3	1.6	0.16 J	0.36 J	0.16 J	0.36 U	0.32 J	0.51	0.23 J

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S000101	025S000202	025S000301	025S000302	025S000402	025S000502	025S000702	025S000900	025S000902
1,2,4-Trichlorobenzene	7500	560	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
1,2-Dichlorobenzene	4600	650	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
1,3-Dichlorobenzene	180	27	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
1,4-Dichlorobenzene	9	6	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	0.8 U	0.81 U	0.81 U	0.82 U	0.84 U	0.85 U	0.82 U	0.86 U	0.81 U
2,4,6-Trichlorophenol	180	72	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2,4-Dichlorophenol	1300	130	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2,4-Dimethylphenol	9800	910	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2,4-Dinitrophenol	620	66	0.8 U	0.81 U	0.81 U	0.82 U	0.84 U	0.85 U	0.82 U	0.86 U	0.81 U
2,4-Dinitrotoluene	3.7	1.3	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2,6-Dinitrotoluene	2.1	1	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2-Chloronaphthalene	49000	4000	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2-Chlorophenol	640	82	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na	0.8 U	0.81 U	0.81 U	0.82 U	0.84 U	0.85 U	0.82 U	0.86 U	0.81 U
2-Methylnaphthalene	560	80	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
2-Nitroaniline	66	5.7	0.8 U	0.81 U	0.81 U	0.82 U	0.84 U	0.85 U	0.82 U	0.86 U	0.81 U
2-Nitrophenol	na	na	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
3-Nitroaniline	na	na	0.8 U	0.81 U	0.81 U	0.82 U	0.84 U	0.85 U	0.82 U	0.86 U	0.81 U
4-Bromophenyl-phenylether	na	na	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
4-Chloro-3-methylphenol	4400	410	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
4-Chloroaniline	2000	190	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
4-Chlorophenylphenyl ether	na	na	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
4-Nitroaniline	56	5.2	0.8 U	0.81 U	0.81 U	0.82 U	0.84 U	0.85 U	0.82 U	0.86 U	0.81 U
4-Nitrophenol	4400	390	0.8 U	0.81 U	0.81 U	0.82 U	0.84 U	0.85 U	0.82 U	0.86 U	0.81 U
Acenaphthene	18000	1900	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Acenaphthylene	11000	1100	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Anthracene	260000	18000	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Benzo(a)anthracene	5	1.4	0.057 J	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Benzo(a)pyrene	0.5	0.1	0.048 J	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Benzo(b)fluoranthene	4.8	1.4	0.11 J	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S000101	025S000202	025S000301	025S000302	025S000402	025S000502	025S000702	025S000900	025S000902
Benzo(g,h,i)perylene	41000	2300	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Benzo(k)fluoranthene	52	15	0.11 J	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
bis(2-Chloroethoxy)methane	na	na	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
(BEHP)	280	76	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Butylbenzylphthalate	320000	15000	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.037 U	0.34 U
Carbazole	190	53	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Chrysene	450	140	0.046 J	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Dibenz(a,h)anthracene	0.5	0.1	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Dibenzofuran	5000	280	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Diethylphthalate	920000	54000	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Dimethylphthalate	na	590000	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Di-n-butylphthalate	140000	7300	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Di-n-octylphthalate	27000	1500	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Fluoranthene	48000	2900	0.086 J	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Fluorene	28000	2200	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Hexachlorobenzene	1.1	0.5	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Hexachlorobutadiene	12	6.3	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Hexachloroethane	78	34	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Isophorone	580	340	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Naphthalene	270	40	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Nitrobenzene	120	14	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
N-Nitrosodiphenylamine	440	170	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Pentachlorophenol	23	7.7	0.8 U	0.81 U	0.81 U	0.82 U	0.84 U	0.85 U	0.82 U	0.86 U	0.81 U
Phenanthrene	30000	2000	0.042 J	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Phenol	390000	900	0.33 U	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U
Pyrene	37000	2200	0.054 J	0.33 U	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S001001	025S001002	025S001101	025S001102	025S001202	025S001302	025S001500	025S001600	025S001601
1,2,4-Trichlorobenzene	7500	560	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
1,2-Dichlorobenzene	4600	650	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
1,3-Dichlorobenzene	180	27	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
1,4-Dichlorobenzene	9	6	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2,4,5-Trichlorophenol	82000	6000	1 U	0.85 U	0.83 U	0.85 U	0.86 U	0.9 U	2.9 U	0.99 U	0.86 U
2,4,6-Trichlorophenol	180	72	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2,4-Dichlorophenol	1300	130	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2,4-Dimethylphenol	9800	910	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2,4-Dinitrophenol	620	66	1 U	0.85 U	0.83 U	0.85 U	0.86 U	0.9 U	2.9 U	0.99 U	0.86 U
2,4-Dinitrotoluene	3.7	1.3	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2,6-Dinitrotoluene	2.1	1	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2-Chloronaphthalene	49000	4000	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2-Chlorophenol	640	82	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2-Methyl-4,6-Dinitrophenol	na	na	1 U	0.85 U	0.83 U	0.85 U	0.86 U	0.9 U	2.9 U	0.99 U	0.86 U
2-Methylnaphthalene	560	80	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2-Methylphenol (o-Cresol)	28000	2400	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
2-Nitroaniline	66	5.7	1 U	0.85 U	0.83 U	0.85 U	0.86 U	0.9 U	2.9 U	0.99 U	0.86 U
2-Nitrophenol	na	na	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
3,3'-Dichlorobenzidine	6.3	2.1	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
3-Nitroaniline	na	na	1 U	0.85 U	0.83 U	0.85 U	0.86 U	0.9 U	2.9 U	0.99 U	0.86 U
4-Bromophenyl-phenylether	na	na	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
4-Chloro-3-methylphenol	4400	410	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
4-Chloroaniline	2000	190	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
4-Chlorophenylphenyl ether	na	na	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
4-Methylphenol (p-Cresol)	3000	250	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
4-Nitroaniline	56	5.2	1 U	0.85 U	0.83 U	0.85 U	0.86 U	0.9 U	2.9 U	0.99 U	0.86 U
4-Nitrophenol	4400	390	1 U	0.85 U	0.83 U	0.85 U	0.86 U	0.9 U	2.9 U	0.99 U	0.86 U
Acenaphthene	18000	1900	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	0.29 J	0.41 U	0.083 J
Acenaphthylene	11000	1100	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Anthracene	260000	18000	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	0.5 J	0.11 J	0.13 J
Benzo(a)anthracene	5	1.4	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.05 J	**2**	0.57	0.36
Benzo(a)pyrene	0.5	0.1	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	**0.12 J**	*** 1.7**	**0.47**	**0.22 J**
Benzo(b)fluoranthene	4.8	1.4	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.25 J	**4.7**	1.3 J	0.56

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S001001	025S001002	025S001101	025S001102	025S001202	025S001302	025S001500	025S001600	025S001601
Benzo(g,h,i)perylene	41000	2300	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.075 J	1.2 U	0.13 J	0.35 U
Benzo(k)fluoranthene	52	15	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.25 J	4.7	1.3 J	0.56
bis(2-Chloroethoxy)methane	na	na	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
bis(2-Chloroethyl)ether	0.4	0.3	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
(BEHP)	280	76	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	15 U	2.1	0.58 U
Butylbenzylphthalate	320000	15000	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.9	0.19 J	0.35 U
Carbazole	190	53	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	0.71 J	0.1 J	0.1 J
Chrysene	450	140	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.069 J	2.2	0.65	0.38
Dibenz(a,h)anthracene	0.5	0.1	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.063 J	0.35 U
Dibenzofuran	5000	280	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.037 J
Diethylphthalate	920000	54000	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Dimethylphthalate	na	590000	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	3 U	0.41 U	0.35 U
Di-n-butylphthalate	140000	7300	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.083 J	0.35 U
Di-n-octylphthalate	27000	1500	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Fluoranthene	48000	2900	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	4.9	1.1	0.58
Fluorene	28000	2200	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	0.25 J	0.41 U	0.078 J
Hexachlorobenzene	1.1	0.5	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Hexachlorobutadiene	12	6.3	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Hexachlorocyclopentadiene	16	2.4	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Hexachloroethane	78	34	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.07 J	0.8 J	0.22 J	0.35 U
Isophorone	580	340	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Naphthalene	270	40	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Nitrobenzene	120	14	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
N-Nitrosodiphenylamine	440	170	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Pentachlorophenol	23	7.7	1 U	0.85 U	0.83 U	0.85 U	0.86 U	0.9 U	2.9 U	0.99 U	0.86 U
Phenanthrene	30000	2000	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	3.2	0.55	0.64
Phenol	390000	900	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	1.2 U	0.41 U	0.35 U
Pyrene	37000	2200	0.42 U	0.35 U	0.34 U	0.35 U	0.35 U	0.37 U	2.9	0.55	0.65

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S001602	025S001700	025S001701	025S001702	025S001800	025S001900	025S001901	025S001902	026S000101
1,2,4-Trichlorobenzene	7500	560	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 UJ
1,2-Dichlorobenzene	4600	650	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
1,3-Dichlorobenzene	180	27	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
1,4-Dichlorobenzene	9	6	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2,4,5-Trichlorophenol	82000	6000	0.83 U	29 U	0.85 U	0.84 U	0.91 U	0.86 U	0.83 U	0.88 U	0.9 U
2,4,6-Trichlorophenol	180	72	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2,4-Dichlorophenol	1300	130	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2,4-Dimethylphenol	9800	910	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2,4-Dinitrophenol	620	66	0.83 U	29 U	0.85 U	0.84 U	0.91 U	0.86 U	0.83 U	0.88 U	0.9 UJ
2,4-Dinitrotoluene	3.7	1.3	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2,6-Dinitrotoluene	2.1	1	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2-Chloronaphthalene	49000	4000	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2-Chlorophenol	640	82	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2-Methyl-4,6-Dinitrophenol	na	na	0.83 U	29 U	0.85 U	0.84 U	0.91 U	0.86 U	0.83 U	0.88 U	0.9 U
2-Methylnaphthalene	560	80	0.34 U	12 U	0.35 U	0.35 U	0.061 J	0.35 U	0.34 U	0.36 U	0.36 U
2-Methylphenol (o-Cresol)	28000	2400	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
2-Nitroaniline	66	5.7	0.83 U	29 U	0.85 U	0.84 U	0.91 U	0.86 U	0.83 U	0.88 U	0.9 U
2-Nitrophenol	na	na	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
3,3'-Dichlorobenzidine	6.3	2.1	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
3-Nitroaniline	na	na	0.83 U	29 U	0.85 U	0.84 U	0.91 U	0.86 U	0.83 U	0.88 U	0.9 U
4-Bromophenyl-phenylether	na	na	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
4-Chloro-3-methylphenol	4400	410	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
4-Chloroaniline	2000	190	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
4-Chlorophenylphenyl ether	na	na	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 UJ
4-Methylphenol (p-Cresol)	3000	250	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
4-Nitroaniline	56	5.2	0.83 U	29 U	0.85 U	0.84 U	0.91 U	0.86 U	0.83 U	0.88 U	0.9 U
4-Nitrophenol	4400	390	0.83 U	29 U	0.85 U	0.84 U	0.91 U	0.86 U	0.83 U	0.88 U	0.9 U
Acenaphthene	18000	1900	0.34 U	12 U	0.35 U	0.35 U	0.29 J	0.35 U	0.34 U	0.36 U	0.36 U
Acenaphthylene	11000	1100	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Anthracene	260000	18000	0.34 U	1.2 J	0.35 U	0.35 U	0.48	0.35 U	0.34 U	0.36 U	0.36 U
Benzo(a)anthracene	5	1.4	0.34 U	**3.8 J**	0.35 U	0.35 U	1.3	0.35 U	0.34 U	0.36 U	0.12 J
Benzo(a)pyrene	0.5	0.1	0.34 U	* **3.4 J**	0.35 U	0.35 U	* **0.63**	0.35 U	0.34 U	0.36 U	**0.1 J**
Benzo(b)fluoranthene	4.8	1.4	0.34 U	* **7.7 J**	0.35 U	0.35 U	**1.8**	0.35 U	0.064 J	0.16 J	0.24 J

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S001602	025S001700	025S001701	025S001702	025S001800	025S001900	025S001901	025S001902	026S000101
Benzo(g,h,i)perylene	41000	2300	0.34 U	6.1 J	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Benzo(k)fluoranthene	52	15	0.34 U	7.7 J	0.35 U	0.35 U	1.8	0.35 U	0.34 U	0.16 J	0.17 J
bis(2-Chloroethoxy)methane	na	na	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
bis(2-Chloroethyl)ether	0.4	0.3	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 UJ
(BEHP)	280	76	0.34 U	12 U	0.35 U	0.35 U	0.79 U	0.35 U	0.34 U	0.38 U	0.04 J
Butylbenzylphthalate	320000	15000	0.34 U	4.9 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.06 J
Carbazole	190	53	0.34 U	1.2 J	0.35 U	0.35 U	0.54	0.35 U	0.34 U	0.36 U	0.36 U
Chrysene	450	140	0.34 U	4.4 J	0.35 U	0.35 U	1.2	0.35 U	0.34 U	0.061 J	0.12 J
Dibenz(a,h)anthracene	0.5	0.1	0.34 U	* **2.2 J**	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Dibenzofuran	5000	280	0.34 U	12 U	0.35 U	0.35 U	0.16 J	0.35 U	0.34 U	0.36 U	0.36 U
Diethylphthalate	920000	54000	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Dimethylphthalate	na	590000	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Di-n-butylphthalate	140000	7300	0.34 U	12 J	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Di-n-octylphthalate	27000	1500	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 UJ
Fluoranthene	48000	2900	0.34 U	7.9 J	0.35 U	0.35 U	2.5	0.35 U	0.34 U	0.097 J	0.2 J
Fluorene	28000	2200	0.34 U	12 U	0.35 U	0.35 U	0.3 J	0.35 U	0.34 U	0.36 U	0.36 U
Hexachlorobenzene	1.1	0.5	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 UJ
Hexachlorobutadiene	12	6.3	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Hexachlorocyclopentadiene	16	2.4	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Hexachloroethane	78	34	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.34 U	**5.1 J**	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Isophorone	580	340	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Naphthalene	270	40	0.34 U	12 U	0.35 U	0.35 U	0.089 J	0.35 U	0.34 U	0.36 U	0.36 U
Nitrobenzene	120	14	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
N-Nitrosodiphenylamine	440	170	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Pentachlorophenol	23	7.7	0.83 U	29 U	0.85 U	0.84 U	0.91 U	0.86 U	0.83 U	0.88 U	0.9 U
Phenanthrene	30000	2000	0.34 U	6.6 J	0.35 U	0.35 U	2.4	0.35 U	0.34 U	0.056 J	0.15 J
Phenol	390000	900	0.34 U	12 U	0.35 U	0.35 U	0.37 U	0.35 U	0.34 U	0.36 U	0.36 U
Pyrene	37000	2200	0.34 U	4.4 J	0.35 U	0.35 U	1.8	0.35 U	0.34 U	0.059 J	0.15 J

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	026S000201	026S000301	026S000501	026S000601	027S000100	027S000101	027S000201	027S000202	027S000301
1,2,4-Trichlorobenzene	7500	560	0.34 U	0.34 UJ	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
1,2-Dichlorobenzene	4600	650	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
1,3-Dichlorobenzene	180	27	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
1,4-Dichlorobenzene	9	6	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2,4,5-Trichlorophenol	82000	6000	0.82 U	0.86 U	0.87 U	0.84 UJ	0.82 U	0.86 U	0.81 U	0.79 U	0.9 U
2,4,6-Trichlorophenol	180	72	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2,4-Dichlorophenol	1300	130	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2,4-Dimethylphenol	9800	910	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2,4-Dinitrophenol	620	66	0.85 U	0.86 U	0.91 U	0.84 UJ	0.82 U	0.86 U	0.81 U	0.79 U	0.9 U
2,4-Dinitrotoluene	3.7	1.3	0.34 U	0.34 UJ	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2,6-Dinitrotoluene	2.1	1	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2-Chloronaphthalene	49000	4000	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2-Chlorophenol	640	82	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2-Methyl-4,6-Dinitrophenol	na	na	0.85 U	0.86 U	0.91 U	0.84 UJ	0.82 U	0.86 U	0.81 U	0.79 U	0.9 U
2-Methylnaphthalene	560	80	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2-Methylphenol (o-Cresol)	28000	2400	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
2-Nitroaniline	66	5.7	0.85 U	0.86 U	0.91 U	0.84 UJ	0.82 U	0.86 U	0.81 U	0.79 U	0.9 U
2-Nitrophenol	na	na	0.34 UJ	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
3,3'-Dichlorobenzidine	6.3	2.1	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
3-Nitroaniline	na	na	0.85 U	0.86 U	0.91 U	0.84 UJ	0.82 U	0.86 U	0.81 U	0.79 U	0.9 U
4-Bromophenyl-phenylether	na	na	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
4-Chloro-3-methylphenol	4400	410	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
4-Chloroaniline	2000	190	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
4-Chlorophenylphenyl ether	na	na	0.34 U	0.34 UJ	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
4-Methylphenol (p-Cresol)	3000	250	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
4-Nitroaniline	56	5.2	0.85 U	0.86 U	0.91 U	0.84 UJ	0.82 U	0.86 U	0.81 U	0.79 U	0.9 U
4-Nitrophenol	4400	390	0.85 U	0.86 U	0.91 U	0.84 UJ	0.82 U	0.86 U	0.81 U	0.79 U	0.9 U
Acenaphthene	18000	1900	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Acenaphthylene	11000	1100	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Anthracene	260000	18000	0.34 U	0.34 U	0.038 J	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Benzo(a)anthracene	5	1.4	0.34 U	0.34 U	0.14 J	0.051 J	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Benzo(a)pyrene	0.5	0.1	0.34 U	0.34 U	0.088 J	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Benzo(b)fluoranthene	4.8	1.4	0.34 U	0.34 U	0.22 J	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	026S000201	026S000301	026S000501	026S000601	027S000100	027S000101	027S000201	027S000202	027S000301
Benzo(g,h,i)perylene	41000	2300	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Benzo(k)fluoranthene	52	15	0.34 U	0.34 UJ	0.2 J	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
bis(2-Chloroethoxy)methane	na	na	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
bis(2-Chloroethyl)ether	0.4	0.3	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.34 UJ	0.34 UJ	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
(BEHP)	280	76	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Butylbenzylphthalate	320000	15000	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Carbazole	190	53	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Chrysene	450	140	0.34 U	0.34 U	0.14 J	0.057 J	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Dibenz(a,h)anthracene	0.5	0.1	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Dibenzofuran	5000	280	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Diethylphthalate	920000	54000	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Dimethylphthalate	na	590000	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Di-n-butylphthalate	140000	7300	0.04 U	0.34 U	0.066 J	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Di-n-octylphthalate	27000	1500	0.34 U	0.34 UJ	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Fluoranthene	48000	2900	0.34 U	0.34 U	0.25 J	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Fluorene	28000	2200	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Hexachlorobenzene	1.1	0.5	0.34 U	0.34 UJ	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Hexachlorobutadiene	12	6.3	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Hexachlorocyclopentadiene	16	2.4	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Hexachloroethane	78	34	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Isophorone	580	340	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Naphthalene	270	40	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Nitrobenzene	120	14	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.34 U	0.34 U	0.36 UJ		0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
N-Nitrosodiphenylamine	440	170	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Pentachlorophenol	23	7.7	0.85 U	0.86 U	0.91 U		0.82 U	0.86 U	0.81 U	0.79 U	0.9 U
Phenanthrene	30000	2000	0.34 U	0.34 U	0.24 J	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Phenol	390000	900	0.34 U	0.34 U	0.36 U	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U
Pyrene	37000	2200	0.34 U	0.34 U	0.23 J	0.34 UJ	0.34 U	0.35 U	0.33 U	0.32 U	0.37 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S000302	027S000401	027S000402	027S000501	027S000502	027S000601	027S000602	027S000701	027S000702
1,2,4-Trichlorobenzene	7500	560	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
1,2-Dichlorobenzene	4600	650	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
1,3-Dichlorobenzene	180	27	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
1,4-Dichlorobenzene	9	6	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	0.82 U	0.81 U	8.1 U	0.88 U	0.82 U	1.1 U	0.83 U	0.82 U	0.82 U
2,4,6-Trichlorophenol	180	72	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2,4-Dichlorophenol	1300	130	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2,4-Dimethylphenol	9800	910	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2,4-Dinitrophenol	620	66	0.82 U	0.81 U	8.1 U	0.88 U	0.82 U	1.1 U	0.83 U	0.82 U	0.82 U
2,4-Dinitrotoluene	3.7	1.3	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2,6-Dinitrotoluene	2.1	1	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2-Chloronaphthalene	49000	4000	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2-Chlorophenol	640	82	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na	0.82 U	0.81 U	8.1 U	0.88 U	0.82 U	1.1 U	0.83 U	0.82 U	0.82 U
2-Methylnaphthalene	560	80	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
2-Nitroaniline	66	5.7	0.82 U	0.81 U	8.1 U	0.88 U	0.82 U	1.1 U	0.83 U	0.82 U	0.82 U
2-Nitrophenol	na	na	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
3-Nitroaniline	na	na	0.82 U	0.81 U	8.1 U	0.88 U	0.82 U	1.1 U	0.83 U	0.82 U	0.82 U
4-Bromophenyl-phenylether	na	na	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
4-Chloro-3-methylphenol	4400	410	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
4-Chloroaniline	2000	190	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
4-Chlorophenylphenyl ether	na	na	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
4-Nitroaniline	56	5.2	0.82 U	0.81 U	8.1 U	0.88 U	0.82 U	1.1 U	0.83 U	0.82 U	0.82 U
4-Nitrophenol	4400	390	0.82 U	0.81 U	8.1 U	0.88 U	0.82 U	1.1 U	0.83 U	0.82 U	0.82 U
Acenaphthene	18000	1900	0.34 U	0.33 U	1.8 J	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Acenaphthylene	11000	1100	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Anthracene	260000	18000	0.34 U	0.33 U	3.2 J	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Benzo(a)anthracene	5	1.4	0.34 U	0.094 J	* **9.5**	0.36 U	0.34 U	0.24 J	0.34 U	0.34 U	0.34 U
Benzo(a)pyrene	0.5	0.1	0.34 U	0.068 J	* **5.6**	0.36 U	0.34 U	**0.17 J**	0.34 U	0.34 U	0.34 U
Benzo(b)fluoranthene	4.8	1.4	0.34 U	0.14 U	* **13 J**	0.36 U	0.34 U	0.41	0.34 U	0.34 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S000302	027S000401	027S000402	027S000501	027S000502	027S000601	027S000602	027S000701	027S000702
Benzo(g,h,i)perylene	41000	2300	0.34 U	0.33 U	4.4	0.36 U	0.34 U	0.17 J	0.34 U	0.34 U	0.34 U
Benzo(k)fluoranthene	52	15	0.34 U	0.14 U	13 J	0.36 U	0.34 U	0.41	0.34 U	0.34 U	0.34 U
bis(2-Chloroethoxy)methane	na	na	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
(BEHP)	280	76	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	5.7 J	0.34 U
Butylbenzylphthalate	320000	15000	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.33 J	0.34 U
Carbazole	190	53	0.34 U	0.33 U	3 J	0.36 U	0.34 U	0.048 J	0.34 U	0.34 U	0.34 U
Chrysene	450	140	0.34 U	0.075 J	6.4	0.36 U	0.34 U	0.28 J	0.34 U	0.34 U	0.34 U
Dibenz(a,h)anthracene	0.5	0.1	0.34 U	0.33 U	* **1.2 J**	0.36 U	0.34 U	0.059 J	0.34 U	0.34 U	0.34 U
Dibenzofuran	5000	280	0.34 U	0.33 U	0.77 J	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Diethylphthalate	920000	54000	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Dimethylphthalate	na	590000	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Di-n-butylphthalate	140000	7300	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.16 J	0.34 U
Di-n-octylphthalate	27000	1500	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.046 J	0.34 U
Fluoranthene	48000	2900	0.34 U	0.18 J	19	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Fluorene	28000	2200	0.34 U	0.33 U	1.5 J	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Hexachlorobenzene	1.1	0.5	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Hexachlorobutadiene	12	6.3	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Hexachloroethane	78	34	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.34 U	0.052 J	**3.4**	0.36 U	0.34 U	0.18 J	0.34 U	0.34 U	0.34 U
Isophorone	580	340	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Naphthalene	270	40	0.34 U	0.33 U	0.44 J	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Nitrobenzene	120	14	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
N-Nitrosodiphenylamine	440	170	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Pentachlorophenol	23	7.7	0.82 U	0.81 U	8.1 U	0.88 U	0.82 U	1.1 U	0.83 U	0.82 U	0.82 U
Phenanthrene	30000	2000	0.34 U	0.11 J	15	0.36 U	0.34 U	0.2 J	0.34 U	0.34 U	0.34 U
Phenol	390000	900	0.34 U	0.33 U	3.3 U	0.36 U	0.34 U	0.45 U	0.34 U	0.34 U	0.34 U
Pyrene	37000	2200	0.34 U	0.13 J	14	0.36 U	0.34 U	0.38 J	0.34 U	0.34 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S000801	027S000802	027S000901	027S000902	027S001002	027S001202	027S001302	027S001402	027S001501
1,2,4-Trichlorobenzene	7500	560	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
1,2-Dichlorobenzene	4600	650	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
1,3-Dichlorobenzene	180	27	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
1,4-Dichlorobenzene	9	6	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	0.8 U	0.86 U	0.86 U	0.81 U	0.87 U	0.82 U	0.88 U	0.81 U	0.81 U
2,4,6-Trichlorophenol	180	72	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2,4-Dichlorophenol	1300	130	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2,4-Dimethylphenol	9800	910	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2,4-Dinitrophenol	620	66	0.8 U	0.86 U	0.86 U	0.81 U	0.87 U	0.82 U	0.88 U	0.81 U	0.81 U
2,4-Dinitrotoluene	3.7	1.3	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2,6-Dinitrotoluene	2.1	1	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2-Chloronaphthalene	49000	4000	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2-Chlorophenol	640	82	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na	0.8 U	0.86 U	0.86 U	0.81 U	0.87 U	0.82 U	0.88 U	0.81 U	0.81 U
2-Methylnaphthalene	560	80	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
2-Nitroaniline	66	5.7	0.8 U	0.86 U	0.86 U	0.81 U	0.87 U	0.82 U	0.88 U	0.81 U	0.81 U
2-Nitrophenol	na	na	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
3-Nitroaniline	na	na	0.8 U	0.86 U	0.86 U	0.81 U	0.87 U	0.82 U	0.88 U	0.81 U	0.81 U
4-Bromophenyl-phenylether	na	na	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
4-Chloro-3-methylphenol	4400	410	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
4-Chloroaniline	2000	190	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
4-Chlorophenylphenyl ether	na	na	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
4-Nitroaniline	56	5.2	0.8 U	0.86 U	0.86 U	0.81 U	0.87 U	0.82 U	0.88 U	0.81 U	0.81 U
4-Nitrophenol	4400	390	0.8 U	0.86 U	0.86 U	0.81 U	0.87 U	0.82 U	0.88 U	0.81 U	0.81 U
Acenaphthene	18000	1900	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Acenaphthylene	11000	1100	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Anthracene	260000	18000	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Benzo(a)anthracene	5	1.4	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Benzo(a)pyrene	0.5	0.1	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Benzo(b)fluoranthene	4.8	1.4	0.058 J	0.054 J	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S000801	027S000802	027S000901	027S000902	027S001002	027S001202	027S001302	027S001402	027S001501
Benzo(g,h,i)perylene	41000	2300	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Benzo(k)fluoranthene	52	15	0.058 J	0.054 J	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
bis(2-Chloroethoxy)methane	na	na	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
(BEHP)	280	76	0.33 U	0.36 J	0.036 U	0.044 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Butylbenzylphthalate	320000	15000	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Carbazole	190	53	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Chrysene	450	140	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Dibenz(a,h)anthracene	0.5	0.1	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Dibenzofuran	5000	280	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Diethylphthalate	920000	54000	0.65 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.037 U	0.34 U
Dimethylphthalate	na	590000	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Di-n-butylphthalate	140000	7300	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Di-n-octylphthalate	27000	1500	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Fluoranthene	48000	2900	0.04 J	0.04 J	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Fluorene	28000	2200	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Hexachlorobenzene	1.1	0.5	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Hexachlorobutadiene	12	6.3	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Hexachloroethane	78	34	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Isophorone	580	340	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Naphthalene	270	40	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Nitrobenzene	120	14	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
N-Nitrosodiphenylamine	440	170	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Pentachlorophenol	23	7.7	0.8 U	0.86 U	0.86 U	0.81 U	0.87 U	0.82 U	0.88 U	0.81 U	0.81 U
Phenanthrene	30000	2000	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Phenol	390000	900	0.33 U	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U
Pyrene	37000	2200	0.038 J	0.36 U	0.35 U	0.34 U	0.36 U	0.34 U	0.36 U	0.33 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S001701	027S001702	027S001900	027S002000	027S002002	027S002102	027S002202	027S002302	027S002402
1,2,4-Trichlorobenzene	7500	560	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
1,2-Dichlorobenzene	4600	650	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
1,3-Dichlorobenzene	180	27	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
1,4-Dichlorobenzene	9	6	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2,4,5-Trichlorophenol	82000	6000	0.81 U	0.85 U	0.83 U	0.89 U	0.86 U	0.83 U	0.84 U	0.83 U	0.85 U
2,4,6-Trichlorophenol	180	72	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2,4-Dichlorophenol	1300	130	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2,4-Dimethylphenol	9800	910	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2,4-Dinitrophenol	620	66	0.81 U	0.85 U	0.83 U	0.89 U	0.86 U	0.83 U	0.84 U	0.83 U	0.85 U
2,4-Dinitrotoluene	3.7	1.3	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2,6-Dinitrotoluene	2.1	1	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2-Chloronaphthalene	49000	4000	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2-Chlorophenol	640	82	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2-Methyl-4,6-Dinitrophenol	na	na	0.81 U	0.85 U	0.83 U	0.89 U	0.86 U	0.83 U	0.84 U	0.83 U	0.85 U
2-Methylnaphthalene	560	80	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2-Methylphenol (o-Cresol)	28000	2400	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
2-Nitroaniline	66	5.7	0.81 U	0.85 U	0.83 U	0.89 U	0.86 U	0.83 U	0.84 U	0.83 U	0.85 U
2-Nitrophenol	na	na	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
3,3'-Dichlorobenzidine	6.3	2.1	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
3-Nitroaniline	na	na	0.81 U	0.85 U	0.83 U	0.89 U	0.86 U	0.83 U	0.84 U	0.83 U	0.85 U
4-Bromophenyl-phenylether	na	na	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
4-Chloro-3-methylphenol	4400	410	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
4-Chloroaniline	2000	190	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
4-Chlorophenylphenyl ether	na	na	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
4-Methylphenol (p-Cresol)	3000	250	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
4-Nitroaniline	56	5.2	0.81 U	0.85 U	0.83 U	0.89 U	0.86 U	0.83 U	0.84 U	0.83 U	0.85 U
4-Nitrophenol	4400	390	0.81 U	0.85 U	0.83 U	0.89 U	0.86 U	0.83 U	0.84 U	0.83 U	0.85 U
Acenaphthene	18000	1900	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Acenaphthylene	11000	1100	0.034 J	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Anthracene	260000	18000	0.34 U	0.35 U	0.058 J	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Benzo(a)anthracene	5	1.4	0.16 J	0.35 U	0.12 J	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Benzo(a)pyrene	0.5	0.1	**0.19 J**	0.35 U	**0.11 J**	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Benzo(b)fluoranthene	4.8	1.4	0.29 J	0.35 U	0.3 J	0.054 J	0.35 U	0.037 J	0.35 U	0.34 U	0.35 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S001701	027S001702	027S001900	027S002000	027S002002	027S002102	027S002202	027S002302	027S002402
Benzo(g,h,i)perylene	41000	2300	0.097 J	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Benzo(k)fluoranthene	52	15	0.29 J	0.35 U	0.35	0.37 U	0.35 U	0.037 J	0.35 U	0.34 U	0.35 U
bis(2-Chloroethoxy)methane	na	na	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
bis(2-Chloroethyl)ether	0.4	0.3	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
(BEHP)	280	76	0.34 U	0.35 U	0.34 U	0.37 J	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Butylbenzylphthalate	320000	15000	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Carbazole	190	53	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Chrysene	450	140	0.14 J	0.35 U	0.15 J	0.05 J	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Dibenz(a,h)anthracene	0.5	0.1	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Dibenzofuran	5000	280	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Diethylphthalate	920000	54000	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Dimethylphthalate	na	590000	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Di-n-butylphthalate	140000	7300	0.34 U	0.35 U	0.99 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Di-n-octylphthalate	27000	1500	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Fluoranthene	48000	2900	0.13 J	0.35 U	0.24 J	0.066 J	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Fluorene	28000	2200	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Hexachlorobenzene	1.1	0.5	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Hexachlorobutadiene	12	6.3	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Hexachlorocyclopentadiene	16	2.4	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Hexachloroethane	78	34	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.12 J	0.35 U	0.049 J	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Isophorone	580	340	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Naphthalene	270	40	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Nitrobenzene	120	14	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
N-Nitrosodiphenylamine	440	170	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Pentachlorophenol	23	7.7	0.81 U	0.85 U	0.83 U	0.89 U	0.86 U	0.83 U	0.84 U	0.83 U	0.85 U
Phenanthrene	30000	2000	0.34 U	0.35 U	0.056 J	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Phenol	390000	900	0.34 U	0.35 U	0.34 U	0.37 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U
Pyrene	37000	2200	0.16 J	0.35 U	0.2 J	0.061 J	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S002600	027S002602	027S002701	027S002702	027S002802	027S002902	027S003002	027S003202	027S003302
1,2,4-Trichlorobenzene	7500	560	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
1,2-Dichlorobenzene	4600	650	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
1,3-Dichlorobenzene	180	27	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
1,4-Dichlorobenzene	9	6	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	0.85 U	0.88 U	16 U	16 U	0.96 U	0.83 U	0.81 U	0.82 U	0.82 U
2,4,6-Trichlorophenol	180	72	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2,4-Dichlorophenol	1300	130	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2,4-Dimethylphenol	9800	910	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2,4-Dinitrophenol	620	66	0.85 U	0.88 U	16 U	16 U	0.96 U	0.83 U	0.81 U	0.82 U	0.82 U
2,4-Dinitrotoluene	3.7	1.3	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2,6-Dinitrotoluene	2.1	1	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2-Chloronaphthalene	49000	4000	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2-Chlorophenol	640	82	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na	0.85 U	0.88 U	16 U	16 U	0.96 U	0.83 U	0.81 U	0.82 U	0.82 U
2-Methylnaphthalene	560	80	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
2-Nitroaniline	66	5.7	0.85 U	0.88 U	16 U	16 U	0.96 U	0.83 U	0.81 U	0.82 U	0.82 U
2-Nitrophenol	na	na	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
3-Nitroaniline	na	na	0.85 U	0.88 U	16 U	16 U	0.96 U	0.83 U	0.81 U	0.82 U	0.82 U
4-Bromophenyl-phenylether	na	na	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
4-Chloro-3-methylphenol	4400	410	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
4-Chloroaniline	2000	190	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
4-Chlorophenylphenyl ether	na	na	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
4-Nitroaniline	56	5.2	0.85 U	0.88 U	16 U	16 U	0.96 U	0.83 U	0.81 U	0.82 U	0.82 U
4-Nitrophenol	4400	390	0.85 U	0.88 U	16 U	16 U	0.96 U	0.83 U	0.81 U	0.82 U	0.82 U
Acenaphthene	18000	1900	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Acenaphthylene	11000	1100	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Anthracene	260000	18000	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Benzo(a)anthracene	5	1.4	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Benzo(a)pyrene	0.5	0.1	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Benzo(b)fluoranthene	4.8	1.4	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S002600	027S002602	027S002701	027S002702	027S002802	027S002902	027S003002	027S003202	027S003302
Benzo(g,h,i)perylene	41000	2300	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Benzo(k)fluoranthene	52	15	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
bis(2-Chloroethoxy)methane	na	na	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
(BEHP)	280	76	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Butylbenzylphthalate	320000	15000	0.036 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Carbazole	190	53	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Chrysene	450	140	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Dibenz(a,h)anthracene	0.5	0.1	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Dibenzofuran	5000	280	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Diethylphthalate	920000	54000	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Dimethylphthalate	na	590000	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Di-n-butylphthalate	140000	7300	0.35 U	0.36 U	0.77 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Di-n-octylphthalate	27000	1500	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Fluoranthene	48000	2900	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Fluorene	28000	2200	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Hexachlorobenzene	1.1	0.5	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Hexachlorobutadiene	12	6.3	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Hexachloroethane	78	34	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Isophorone	580	340	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Naphthalene	270	40	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Nitrobenzene	120	14	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
N-Nitrosodiphenylamine	440	170	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Pentachlorophenol	23	7.7	0.85 U	0.88 U	16 U	16 U	0.96 U	0.83 U	0.81 U	0.82 U	0.82 U
Phenanthrene	30000	2000	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Phenol	390000	900	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U
Pyrene	37000	2200	0.35 U	0.36 U	6.6 U	6.6 U	0.4 U	0.34 U	0.33 U	0.34 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S004000	027S004002	027S004100	027S004102	027S004202	027S004302	027S004402	027S004502	027S004602
1,2,4-Trichlorobenzene	7500	560	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
1,2-Dichlorobenzene	4600	650	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
1,3-Dichlorobenzene	180	27	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
1,4-Dichlorobenzene	9	6	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2,4,5-Trichlorophenol	82000	6000	0.84 U	0.83 U	1.8 U	0.82 U	0.84 U	0.84 U	0.85 U	0.83 U	0.85 U
2,4,6-Trichlorophenol	180	72	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2,4-Dichlorophenol	1300	130	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2,4-Dimethylphenol	9800	910	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2,4-Dinitrophenol	620	66	0.84 U	0.83 U	1.8 U	0.82 U	0.84 U	0.84 U	0.85 U	0.83 U	0.85 U
2,4-Dinitrotoluene	3.7	1.3	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2,6-Dinitrotoluene	2.1	1	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2-Chloronaphthalene	49000	4000	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2-Chlorophenol	640	82	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2-Methyl-4,6-Dinitrophenol	na	na	0.84 U	0.83 U	1.8 U	0.82 U	0.84 U	0.84 U	0.85 U	0.83 U	0.85 U
2-Methylnaphthalene	560	80	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2-Methylphenol (o-Cresol)	28000	2400	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
2-Nitroaniline	66	5.7	0.84 U	0.83 U	1.8 U	0.82 U	0.84 U	0.84 U	0.85 U	0.83 U	0.85 U
2-Nitrophenol	na	na	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
3,3'-Dichlorobenzidine	6.3	2.1	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
3-Nitroaniline	na	na	0.84 U	0.83 U	1.8 U	0.82 U	0.84 U	0.84 U	0.85 U	0.83 U	0.85 U
4-Bromophenyl-phenylether	na	na	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
4-Chloro-3-methylphenol	4400	410	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
4-Chloroaniline	2000	190	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
4-Chlorophenylphenyl ether	na	na	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
4-Methylphenol (p-Cresol)	3000	250	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
4-Nitroaniline	56	5.2	0.84 U	0.83 U	1.8 U	0.82 U	0.84 U	0.84 U	0.85 U	0.83 U	0.85 U
4-Nitrophenol	4400	390	0.84 U	0.83 U	1.8 U	0.82 U	0.84 U	0.84 U	0.85 U	0.83 U	0.85 U
Acenaphthene	18000	1900	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Acenaphthylene	11000	1100	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Anthracene	260000	18000	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Benzo(a)anthracene	5	1.4	0.32 J	0.34 U	0.081 J	0.34 U	0.35 U	0.35 U	0.059 J	0.34 U	0.35 U
Benzo(a)pyrene	0.5	0.1	**0.21 J**	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.04 J	0.34 U	0.35 U
Benzo(b)fluoranthene	4.8	1.4	0.65 J	0.34 U	0.18 J	0.34 U	0.35 U	0.35 U	0.096 J	0.34 U	0.35 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S004000	027S004002	027S004100	027S004102	027S004202	027S004302	027S004402	027S004502	027S004602
Benzo(g,h,i)perylene	41000	2300	0.18 J	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Benzo(k)fluoranthene	52	15	0.65 J	0.34 U	0.18 J	0.34 U	0.35 U	0.35 U	0.096 J	0.34 U	0.35 U
bis(2-Chloroethoxy)methane	na	na	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
bis(2-Chloroethyl)ether	0.4	0.3	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
(BEHP)	280	76	0.073 J	0.34 U	0.21 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Butylbenzylphthalate	320000	15000	0.24 J	0.34 U	0.2 J	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Carbazole	190	53	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Chrysene	450	140	0.33 J	0.34 U	0.089 J	0.34 U	0.35 U	0.35 U	0.054 J	0.34 U	0.35 U
Dibenz(a,h)anthracene	0.5	0.1	0.091 J	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Dibenzofuran	5000	280	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Diethylphthalate	920000	54000	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Dimethylphthalate	na	590000	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Di-n-butylphthalate	140000	7300	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Di-n-octylphthalate	27000	1500	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Fluoranthene	48000	2900	0.31 J	0.34 U	0.15 J	0.34 U	0.35 U	0.35 U	0.16 J	0.34 U	0.35 U
Fluorene	28000	2200	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Hexachlorobenzene	1.1	0.5	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Hexachlorobutadiene	12	6.3	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Hexachlorocyclopentadiene	16	2.4	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Hexachloroethane	78	34	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.24 J	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Isophorone	580	340	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Naphthalene	270	40	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Nitrobenzene	120	14	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
N-Nitrosodiphenylamine	440	170	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Pentachlorophenol	23	7.7	0.84 U	0.83 U	1.8 U	0.82 U	0.84 U	0.84 U	0.85 U	0.83 U	0.85 U
Phenanthrene	30000	2000	0.35 U	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.11 J	0.34 U	0.35 U
Phenol	390000	900	0.93	0.34 U	0.76 U	0.34 U	0.35 U	0.35 U	0.35 U	0.34 U	0.35 U
Pyrene	37000	2200	0.23 J	0.34 U	0.084 J	0.34 U	0.35 U	0.35 U	0.074 J	0.34 U	0.35 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S004702	027S004902	027S005002	027S005102	027S005200	027S005201	027S005202	027S005300	027S005301
1,2,4-Trichlorobenzene	7500	560	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
1,2-Dichlorobenzene	4600	650	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
1,3-Dichlorobenzene	180	27	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
1,4-Dichlorobenzene	9	6	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	0.83 U	0.87 U	0.84 U	0.83 U	0.82 U	0.84 U	1.1 U	0.85 U	0.83 U
2,4,6-Trichlorophenol	180	72	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2,4-Dichlorophenol	1300	130	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2,4-Dimethylphenol	9800	910	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2,4-Dinitrophenol	620	66	0.83 U	0.87 U	0.84 U	0.83 U	0.82 U	0.84 U	1.1 U	0.85 U	0.83 U
2,4-Dinitrotoluene	3.7	1.3	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2,6-Dinitrotoluene	2.1	1	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2-Chloronaphthalene	49000	4000	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2-Chlorophenol	640	82	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na	0.83 U	0.87 U	0.84 U	0.83 U	0.82 U	0.84 U	1.1 U	0.85 U	0.83 U
2-Methylnaphthalene	560	80	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.062 J	0.046 J	0.35 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
2-Nitroaniline	66	5.7	0.83 U	0.87 U	0.84 U	0.83 U	0.82 U	0.84 U	1.1 U	0.85 U	0.83 U
2-Nitrophenol	na	na	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
3-Nitroaniline	na	na	0.83 U	0.87 U	0.84 U	0.83 U	0.82 U	0.84 U	1.1 U	0.85 U	0.83 U
4-Bromophenyl-phenylether	na	na	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
4-Chloro-3-methylphenol	4400	410	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
4-Chloroaniline	2000	190	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
4-Chlorophenylphenyl ether	na	na	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
4-Nitroaniline	56	5.2	0.83 U	0.87 U	0.84 U	0.83 U	0.82 U	0.84 U	1.1 U	0.85 U	0.83 U
4-Nitrophenol	4400	390	0.83 U	0.87 U	0.84 U	0.83 U	0.82 U	0.84 U	1.1 U	0.85 U	0.83 U
Acenaphthene	18000	1900	0.34 U	0.36 U	0.35 U	0.34 U	0.22 J	0.35	0.22 J	0.35 U	0.34 U
Acenaphthylene	11000	1100	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Anthracene	260000	18000	0.34 U	0.36 U	0.35 U	0.34 U	0.43	0.81	0.28 J	0.35 U	0.34 U
Benzo(a)anthracene	5	1.4	0.34 U	0.17 J	0.35 U	0.34 U	**1.8**	**2.1 J**	1.3 J	0.35 U	0.11 J
Benzo(a)pyrene	0.5	0.1	0.34 U	**0.13 J**	0.35 U	0.34 U	*** 1.3**	*** 1.5 J**	*** 1.1 J**	0.35 U	0.095 J
Benzo(b)fluoranthene	4.8	1.4	0.34 U	0.31	0.35 U	0.34 U	**2.6 J**	**3.1 J**	**2.4 J**	0.35 U	0.2 J

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S004702	027S004902	027S005002	027S005102	027S005200	027S005201	027S005202	027S005300	027S005301
Benzo(g,h,i)perylene	41000	2300	0.34 U	0.073 J	0.35 U	0.34 U	0.37	0.38	0.32 J	0.35 U	0.34 U
Benzo(k)fluoranthene	52	15	0.34 U	0.31	0.35 U	0.34 U	2.6 J	3.1 J	2.4 J	0.35 U	0.2 J
bis(2-Chloroethoxy)methane	na	na	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
(BEHP)	280	76	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.41 U
Butylbenzylphthalate	320000	15000	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.16 U
Carbazole	190	53	0.34 U	0.36 U	0.35 U	0.34 U	0.44	0.76	0.53	0.35 U	0.34 U
Chrysene	450	140	0.34 U	0.16 J	0.35 U	0.34 U	1.5	1.8 J	1.4 J	0.35 U	0.12 J
Dibenz(a,h)anthracene	0.5	0.1	0.34 U	0.36 U	0.35 U	0.34 U	**0.18 J**	**0.15 J**	**0.15 J**	0.35 U	0.34 U
Dibenzofuran	5000	280	0.34 U	0.36 U	0.35 U	0.34 U	0.071 J	0.21 J	0.14 J	0.35 U	0.34 U
Diethylphthalate	920000	54000	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Dimethylphthalate	na	590000	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Di-n-butylphthalate	140000	7300	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Di-n-octylphthalate	27000	1500	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Fluoranthene	48000	2900	0.34 U	0.25 J	0.35 U	0.34 U	3.9 J	4.9 J	3.8 J	0.35 U	0.25 J
Fluorene	28000	2200	0.34 U	0.36 U	0.35 U	0.34 U	0.17 J	0.4	0.18 J	0.35 U	0.34 U
Hexachlorobenzene	1.1	0.5	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Hexachlorobutadiene	12	6.3	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Hexachloroethane	78	34	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.34 U	0.068 J	0.35 U	0.34 U	0.62	0.66 J	0.51	0.35 U	0.34 U
Isophorone	580	340	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Naphthalene	270	40	0.34 U	0.36 U	0.35 U	0.34 U	0.038 J	0.14 J	0.14 J	0.35 U	0.34 U
Nitrobenzene	120	14	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
N-Nitrosodiphenylamine	440	170	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Pentachlorophenol	23	7.7	0.83 U	0.87 U	0.84 U	0.83 U	0.82 U	0.84 U	1.1 U	0.85 U	0.83 U
Phenanthrene	30000	2000	0.34 U	0.21 J	0.35 U	0.34 U	2.5	3.8 J	2.8 J	0.35 U	0.15 J
Phenol	390000	900	0.34 U	0.36 U	0.35 U	0.34 U	0.34 U	0.35 U	0.44 U	0.35 U	0.34 U
Pyrene	37000	2200	0.34 U	0.18 J	0.35 U	0.34 U	2.2	2.7 J	2 J	0.35 U	0.15 J

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S005302	030S000402	030S000502	030S000602	030S001002	030S001102	030S001202	030S001602	030S001702
1,2,4-Trichlorobenzene	7500	560	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
1,2-Dichlorobenzene	4600	650	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
1,3-Dichlorobenzene	180	27	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
1,4-Dichlorobenzene	9	6	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	0.8 U	0.82 U	0.82 U	0.83 U	0.81 U	0.86 U	1.7 U	0.85 U	0.83 U
2,4,6-Trichlorophenol	180	72	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2,4-Dichlorophenol	1300	130	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2,4-Dimethylphenol	9800	910	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2,4-Dinitrophenol	620	66	0.8 U		0.82 UJ	0.83 U		0.86 UJ	1.7 U	0.85 UJ	0.83 UJ
2,4-Dinitrotoluene	3.7	1.3	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2,6-Dinitrotoluene	2.1	1	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2-Chloronaphthalene	49000	4000	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2-Chlorophenol	640	82	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na	0.8 U	0.82 UJ	0.82 U	0.83 U	0.81 U	0.86 U	1.7 U	0.85 U	0.83 U
2-Methylnaphthalene	560	80	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 UJ	0.69 U	0.35 U	0.34 U
2-Nitroaniline	66	5.7	0.8 U	0.82 U	0.82 U	0.83 UJ	0.81 U	0.86 U	1.7 U	0.85 UJ	0.83 UJ
2-Nitrophenol	na	na	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	0.33 U	0.68 U	0.34 UJ	0.34 UJ	0.67 U	0.35 U	0.69 U	0.35 UJ	0.34 UJ
3-Nitroaniline	na	na	0.8 U	0.82 U	0.82 UJ	0.83 U	0.81 U	0.86 UJ	1.7 UJ	0.85 U	0.83 U
4-Bromophenyl-phenylether	na	na	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
4-Chloro-3-methylphenol	4400	410	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
4-Chloroaniline	2000	190	0.33 U	0.34 U	0.34 UJ	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
4-Chlorophenylphenyl ether	na	na	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
4-Nitroaniline	56	5.2	0.8 U	0.82 U	0.82 U	0.83 UJ	0.81 U	0.86 U	1.7 U	0.85 UJ	0.83 UJ
4-Nitrophenol	4400	390	0.8 U	0.82 U	0.82 U	0.83 U	0.81 U	0.86 U	1.7 U	0.85 UJ	0.83 U
Acenaphthene	18000	1900	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 UJ	0.69 U	0.35 U	0.34 U
Acenaphthylene	11000	1100	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Anthracene	260000	18000	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Benzo(a)anthracene	5	1.4	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.15 J	0.35 U	0.34 U
Benzo(a)pyrene	0.5	0.1	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	**0.17 J**	0.35 U	0.34 U
Benzo(b)fluoranthene	4.8	1.4	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.24 J	0.35 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S005302	030S000402	030S000502	030S000602	030S001002	030S001102	030S001202	030S001602	030S001702
Benzo(g,h,i)perylene	41000	2300	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.16 J	0.35 U	0.34 U
Benzo(k)fluoranthene	52	15	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.042 J	0.16 J	0.35 U	0.34 U
bis(2-Chloroethoxy)methane	na	na	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.33 U	0.34 U	0.34 U	0.34 UJ	0.33 U	0.35 U	0.69 U	0.35 UJ	0.34 UJ
(BEHP)	280	76	0.33 U	0.12 J	0.34 U	0.34 U	0.33 U	0.89 U	0.58 J	0.52 U	0.2 J
Butylbenzylphthalate	320000	15000	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.095 J	0.35 U	0.34 U
Carbazole	190	53	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Chrysene	450	140	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.18 J	0.35 U	0.34 U
Dibenz(a,h)anthracene	0.5	0.1	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Dibenzofuran	5000	280	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Diethylphthalate	920000	54000	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Dimethylphthalate	na	590000	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 UJ	0.34 U
Di-n-butylphthalate	140000	7300	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Di-n-octylphthalate	27000	1500	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 UJ	0.69 U	0.35 U	0.34 UJ
Fluoranthene	48000	2900	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.24 J	0.35 U	0.34 U
Fluorene	28000	2200	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 UJ	0.69 U	0.35 U	0.34 U
Hexachlorobenzene	1.1	0.5	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 UJ	0.34 U
Hexachlorobutadiene	12	6.3	0.33 U	0.34 U	0.34 U	0.34 UJ	0.33 U	0.35 UJ	0.69 U	0.35 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	0.33 U	0.34 U	0.34 U	0.34 U	0.33 UJ	0.35 U	0.69 U	0.35 U	0.34 U
Hexachloroethane	78	34	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.13 J	0.35 U	0.34 U
Isophorone	580	340	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Naphthalene	270	40	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Nitrobenzene	120	14	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
N-Nitrosodiphenylamine	440	170	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Pentachlorophenol	23	7.7	0.8 U	0.82 U	0.82 U	0.83 U	0.81 U	0.86 U	1.7 U	0.85 UJ	0.83 U
Phenanthrene	30000	2000	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.08 J	0.35 U	0.34 U
Phenol	390000	900	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.69 U	0.35 U	0.34 U
Pyrene	37000	2200	0.33 U	0.34 U	0.34 U	0.34 U	0.33 U	0.35 U	0.21 J	0.35 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S001802	030S002002	030S005302	030S005902	030S006102	030S010101	030S010201	030S010202	030S010301
1,2,4-Trichlorobenzene	7500	560	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
1,2-Dichlorobenzene	4600	650	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
1,3-Dichlorobenzene	180	27	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
1,4-Dichlorobenzene	9	6	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2,4,5-Trichlorophenol	82000	6000	0.81 U	0.81 U	0.86 U	0.87 U	0.84 U	0.81 U	0.84 U	4.1 U	0.89 U
2,4,6-Trichlorophenol	180	72	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2,4-Dichlorophenol	1300	130	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2,4-Dimethylphenol	9800	910	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2,4-Dinitrophenol	620	66	0.81 U	0.81 U	0.86 U	0.87 U	0.84 U	0.81 UJ	0.84 U	4.1 UJ	0.89 UJ
2,4-Dinitrotoluene	3.7	1.3	0.34 UJ	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2,6-Dinitrotoluene	2.1	1	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2-Chloronaphthalene	49000	4000	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2-Chlorophenol	640	82	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2-Methyl-4,6-Dinitrophenol	na	na	0.81 U	0.81 U	0.86 U	0.87 U	0.84 U	0.81 U	0.84 U	4.1 U	0.89 U
2-Methylnaphthalene	560	80	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2-Methylphenol (o-Cresol)	28000	2400	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
2-Nitroaniline	66	5.7	0.81 U	0.81 U	0.86 UJ	0.87 U	0.84 UJ	0.81 U	0.84 U	4.1 U	0.89 U
2-Nitrophenol	na	na	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
3,3'-Dichlorobenzidine	6.3	2.1	0.34 UJ	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
3-Nitroaniline	na	na	0.81 U	0.81 U	0.86 U	0.87 UJ	0.84 U	0.81 U	0.84 U	4.1 U	0.89 UJ
4-Bromophenyl-phenylether	na	na	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
4-Chloro-3-methylphenol	4400	410	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
4-Chloroaniline	2000	190	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
4-Chlorophenylphenyl ether	na	na	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
4-Methylphenol (p-Cresol)	3000	250	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 UJ
4-Nitroaniline	56	5.2	0.81 UJ	0.81 UJ	0.86 U	0.87 U	0.84 U	0.81 U	0.84 U	4.1 U	0.89 UJ
4-Nitrophenol	4400	390	0.68 UJ	0.81 UJ	0.86 U	0.87 U	0.84 UJ	0.81 UJ	0.84 U	4.1 UJ	0.89 UJ
Acenaphthene	18000	1900	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Acenaphthylene	11000	1100	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.056 J	0.047 J	0.24 J	0.37 U
Anthracene	260000	18000	0.34 U	0.041 J	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	0.45 J	0.37 U
Benzo(a)anthracene	5	1.4	0.34 U	0.23 J	0.36 U	0.36 U	0.34 U	0.33 U	0.18 J	**1.7**	0.37 U
Benzo(a)pyrene	0.5	0.1	0.34 U	**0.22 J**	0.36 U	0.36 U	0.34 U	0.05 J	**0.19 J**	*** 1.9**	0.37 U
Benzo(b)fluoranthene	4.8	1.4	0.34 U	0.26 J	0.36 U	0.36 U	0.34 U	0.053 J	0.29 J	**2**	0.37 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S001802	030S002002	030S005302	030S005902	030S006102	030S010101	030S010201	030S010202	030S010301
Benzo(g,h,i)perylene	41000	2300	0.34 U	0.17 J	0.36 U	0.36 U	0.34 U	0.05 J	0.34 U	1.3 J	0.37 U
Benzo(k)fluoranthene	52	15	0.34 U	0.22 J	0.36 U	0.36 U	0.34 U	0.056 J	0.23 J	1.5 J	0.37 U
bis(2-Chloroethoxy)methane	na	na	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
bis(2-Chloroethyl)ether	0.4	0.3	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.34 U	0.33 U	0.36 UJ	0.36 UJ	0.34 U	0.33 U	0.34 U	1.7 U	0.37 UJ
(BEHP)	280	76	0.57 U	0.33 U	0.36 U	0.052 U	0.34 U	0.24 J	0.084 J	0.19 J	1.5 U
Butylbenzylphthalate	320000	15000	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 UJ	0.34 U	1.7 UJ	0.37 U
Carbazole	190	53	0.34 U	0.33 U	0.36 U	0.36 UJ	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Chrysene	450	140	0.34 U	0.24 J	0.36 U	0.36 U	0.34 U	0.043 J	0.19 J	1.6 J	0.37 U
Dibenz(a,h)anthracene	0.5	0.1	0.34 U	0.07 J	0.36 U	0.36 U	0.34 U	0.33 U	0.073 J	* **0.58 J**	0.37 U
Dibenzofuran	5000	280	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Diethylphthalate	920000	54000	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Dimethylphthalate	na	590000	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Di-n-butylphthalate	140000	7300	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Di-n-octylphthalate	27000	1500	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 UJ	0.34 U	1.7 UJ	0.37 U
Fluoranthene	48000	2900	0.34 U	0.41	0.36 U	0.36 U	0.34 U	0.062 J	0.3 J	2.6	0.37 U
Fluorene	28000	2200	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Hexachlorobenzene	1.1	0.5	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Hexachlorobutadiene	12	6.3	0.34 UJ	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Hexachlorocyclopentadiene	16	2.4	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 UJ	0.34 U	1.7 UJ	0.37 U
Hexachloroethane	78	34	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 UJ
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.34 U	0.16 J	0.36 U	0.36 U	0.34 U	0.046 J	0.19 J	1.3 J	0.37 U
Isophorone	580	340	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Naphthalene	270	40	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Nitrobenzene	120	14	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 UJ
N-Nitroso-di-n-propylamine	0.2	0.09	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 UJ
N-Nitrosodiphenylamine	440	170	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Pentachlorophenol	23	7.7	0.81 U	0.81 U	0.86 U	0.87 U	0.84 U	0.81 U	0.84 U	4.1 U	0.89 U
Phenanthrene	30000	2000	0.34 U	0.22 J	0.36 U	0.36 U	0.34 U	0.034 J	0.16 J	0.83 J	0.37 U
Phenol	390000	900	0.34 U	0.33 U	0.36 U	0.36 U	0.34 U	0.33 U	0.34 U	1.7 U	0.37 U
Pyrene	37000	2200	0.34 U	0.37	0.36 U	0.36 U	0.34 U	0.059 J	0.3 J	2.3	0.37 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S010401	030S010502	030S010601	030S010802	030S010901	030S011001	030S011102	030S011201	030S011301
1,2,4-Trichlorobenzene	7500	560	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
1,2-Dichlorobenzene	4600	650	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
1,3-Dichlorobenzene	180	27	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
1,4-Dichlorobenzene	9	6	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2,4,5-Trichlorophenol	82000	6000	1.7 U	4.3 U	0.8 UJ	0.82 U	0.87 U	0.8 U	0.81 U	4 U	0.88 U
2,4,6-Trichlorophenol	180	72	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2,4-Dichlorophenol	1300	130	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2,4-Dimethylphenol	9800	910	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2,4-Dinitrophenol	620	66	1.7 U	4.3 U	0.8 U	0.82 UJ	0.87 UJ	0.8 UJ	0.81 U	4 U	0.88 UJ
2,4-Dinitrotoluene	3.7	1.3	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2,6-Dinitrotoluene	2.1	1	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2-Chloronaphthalene	49000	4000	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2-Chlorophenol	640	82	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2-Methyl-4,6-Dinitrophenol	na	na	1.7 U	4.3 U	0.8 U	0.82 U	0.87 U	0.8 U	0.81 U	4 U	0.88 U
2-Methylnaphthalene	560	80	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2-Methylphenol (o-Cresol)	28000	2400	0.72 U	1.8 UJ	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
2-Nitroaniline	66	5.7	1.7 UJ	4.3 U	0.8 U	0.82 UJ	0.87 U	0.8 U	0.81 U	4 U	0.88 U
2-Nitrophenol	na	na	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
3,3'-Dichlorobenzidine	6.3	2.1	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 UJ	0.36 U
3-Nitroaniline	na	na	1.7 U	4.3 UJ	0.8 U	0.82 UJ	0.87 U	0.8 U	0.81 UJ	4 UJ	0.88 UJ
4-Bromophenyl-phenylether	na	na	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
4-Chloro-3-methylphenol	4400	410	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
4-Chloroaniline	2000	190	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
4-Chlorophenylphenyl ether	na	na	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
4-Methylphenol (p-Cresol)	3000	250	0.72 U	1.8 U	0.33 U	0.34 UJ	0.36 U	0.33 U	0.33 U	1.7 U	0.36 UJ
4-Nitroaniline	56	5.2	1.7 U	4.3 UJ	0.8 U	0.82 UJ	0.87 U	0.8 U	0.81 UJ	4 UJ	0.88 UJ
4-Nitrophenol	4400	390	1.7 UJ	4.3 U	0.8 U	0.82 U	0.87 UJ	0.8 UJ	0.81 U	4 UJ	0.88 UJ
Acenaphthene	18000	1900	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Acenaphthylene	11000	1100	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Anthracene	260000	18000	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Benzo(a)anthracene	5	1.4	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Benzo(a)pyrene	0.5	0.1	0.092 J	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Benzo(b)fluoranthene	4.8	1.4	0.11 J	1.8 U	0.33 UJ	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S010401	030S010502	030S010601	030S010802	030S010901	030S011001	030S011102	030S011201	030S011301
Benzo(g,h,i)perylene	41000	2300	0.14 J	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Benzo(k)fluoranthene	52	15	0.11 J	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
bis(2-Chloroethoxy)methane	na	na	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
bis(2-Chloroethyl)ether	0.4	0.3	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.72 U	1.8 UJ	0.33 UJ	0.34 UJ	0.36 U	0.33 U	0.33 U	1.7 U	0.36 UJ
(BEHP)	280	76	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	1.5 U
Butylbenzylphthalate	320000	15000	0.72 U	1.8 U	0.33 UJ	0.34 U	0.36 U	0.33 UJ	0.33 U	1.7 U	0.36 U
Carbazole	190	53	0.72 U	1.8 U	0.33 U	0.34 UJ	0.36 U	0.33 U	0.33 UJ	1.7 U	0.36 U
Chrysene	450	140	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Dibenz(a,h)anthracene	0.5	0.1	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Dibenzofuran	5000	280	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Diethylphthalate	920000	54000	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Dimethylphthalate	na	590000	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Di-n-butylphthalate	140000	7300	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Di-n-octylphthalate	27000	1500	0.72 U	1.8 U	0.33 U	0.34 U	0.36 UJ	0.33 UJ	0.33 U	1.7 U	0.36 U
Fluoranthene	48000	2900	0.09 J	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Fluorene	28000	2200	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Hexachlorobenzene	1.1	0.5	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Hexachlorobutadiene	12	6.3	0.72 U	1.8 UJ	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Hexachlorocyclopentadiene	16	2.4	0.72 U	1.8 U	0.33 U	0.34 U	0.36 UJ	0.33 UJ	0.33 U	1.7 U	0.36 U
Hexachloroethane	78	34	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 UJ
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Isophorone	580	340	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Naphthalene	270	40	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Nitrobenzene	120	14	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 UJ
N-Nitroso-di-n-propylamine	0.2	0.09	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 UJ
N-Nitrosodiphenylamine	440	170	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Pentachlorophenol	23	7.7	1.7 U	4.3 U	0.8 U	0.82 U	0.87 U	0.8 U	0.81 U	4 U	0.88 U
Phenanthrene	30000	2000	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.36 U
Phenol	390000	900	0.72 U	1.8 U	0.33 U	0.34 U	0.36 U	0.33 U	0.33 U	1.7 U	0.047 J
Pyrene	37000	2200	0.091 J	1.8 U	0.33 U	0.34 U	0.36 UJ	0.33 U	0.33 U	1.7 U	0.36 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S011401	030S011501	030S011601	030S011701	030S011802	030S012001	030S012101	030S012201	030S012301
1,2,4-Trichlorobenzene	7500	560	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
1,2-Dichlorobenzene	4600	650	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
1,3-Dichlorobenzene	180	27	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
1,4-Dichlorobenzene	9	6	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	0.83 U	0.85 U	1.7 U	1.7 U	0.84 U	1.6 UJ	0.81 UJ	0.81 U	0.82 U
2,4,6-Trichlorophenol	180	72	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2,4-Dichlorophenol	1300	130	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2,4-Dimethylphenol	9800	910	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2,4-Dinitrophenol	620	66	0.83 UJ	0.85 U	1.7 U	1.7 U	0.84 UJ	1.6 U	0.81 U	0.81 U	0.82 U
2,4-Dinitrotoluene	3.7	1.3	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2,6-Dinitrotoluene	2.1	1	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2-Chloronaphthalene	49000	4000	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2-Chlorophenol	640	82	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na	0.83 U	0.85 U	1.7 U	1.7 U	0.84 U	1.6 U	0.81 U	0.81 U	0.82 U
2-Methylnaphthalene	560	80	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
2-Nitroaniline	66	5.7	0.83 UJ	0.85 U	1.7 U	1.7 U	0.84 U	1.6 U	0.81 U	0.81 U	0.82 U
2-Nitrophenol	na	na	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	0.34 U	0.35 UJ	1.4 U	1.4 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
3-Nitroaniline	na	na	0.83 U	0.85 UJ	1.7 U	1.7 U	0.84 UJ	1.6 U	0.81 U	0.81 UJ	0.82 U
4-Bromophenyl-phenylether	na	na	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
4-Chloro-3-methylphenol	4400	410	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
4-Chloroaniline	2000	190	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
4-Chlorophenylphenyl ether	na	na	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	0.34 U	0.35 U	0.7 U	0.69 U	0.34 UJ	0.68 U	0.34 U	0.33 U	0.34 U
4-Nitroaniline	56	5.2	0.83 U	0.85 UJ	1.7 U	1.7 U	0.84 UJ	1.6 U	0.81 U	0.81 UJ	0.82 U
4-Nitrophenol	4400	390	0.83 U	0.85 UJ	1.7 U	1.7 U	0.84 UJ	1.6 U	0.81 U	0.81 U	0.82 U
Acenaphthene	18000	1900	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Acenaphthylene	11000	1100	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Anthracene	260000	18000	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Benzo(a)anthracene	5	1.4	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Benzo(a)pyrene	0.5	0.1	0.34 U	0.35 U	**0.12 J**	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Benzo(b)fluoranthene	4.8	1.4	0.34 U	0.35 U	0.35 J	0.69 U	0.34 U	0.68 UJ	0.34 UJ	0.33 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S011401	030S011501	030S011601	030S011701	030S011802	030S012001	030S012101	030S012201	030S012301
Benzo(g,h,i)perylene	41000	2300	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Benzo(k)fluoranthene	52	15	0.34 UJ	0.35 U	0.25 J	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
bis(2-Chloroethoxy)methane	na	na	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	0.34 U	0.35 U	0.7 U	0.69 U	0.34 UJ	0.68 UJ	0.34 UJ	0.33 U	0.34 UJ
(BEHP)	280	76	0.34 U	0.54 U	2.6	0.69 J	1.7 J	0.68 U	2	0.33 U	0.039 J
Butylbenzylphthalate	320000	15000	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 UJ	0.34 UJ	0.33 U	0.34 U
Carbazole	190	53	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Chrysene	450	140	0.34 U	0.35 U	0.22 J	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Dibenz(a,h)anthracene	0.5	0.1	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Dibenzofuran	5000	280	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Diethylphthalate	920000	54000	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Dimethylphthalate	na	590000	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Di-n-butylphthalate	140000	7300	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Di-n-octylphthalate	27000	1500	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Fluoranthene	48000	2900	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Fluorene	28000	2200	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Hexachlorobenzene	1.1	0.5	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Hexachlorobutadiene	12	6.3	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Hexachloroethane	78	34	0.34 U	0.35 U	0.7 U	0.69 U	0.34 UJ	0.68 U	0.34 U	0.33 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Isophorone	580	340	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Naphthalene	270	40	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Nitrobenzene	120	14	0.34 U	0.35 U	0.7 U	0.69 U	0.34 UJ	0.68 U	0.34 U	0.33 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	0.34 U	0.35 U	0.7 U	0.69 U	0.34 UJ	0.68 U	0.34 U	0.33 U	0.34 U
N-Nitrosodiphenylamine	440	170	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Pentachlorophenol	23	7.7	0.83 U	0.85 U	1.7 U	1.7 U	0.84 U	1.6 U	0.81 U	0.81 U	0.82 U
Phenanthrene	30000	2000	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Phenol	390000	900	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U
Pyrene	37000	2200	0.34 U	0.35 U	0.7 U	0.69 U	0.34 U	0.68 U	0.34 U	0.33 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S012401	030S012501	030S012602	030S012701	030S012801	030S012901	030S013001	030S013401 1	030S013501
1,2,4-Trichlorobenzene	7500	560	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
1,2-Dichlorobenzene	4600	650	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
1,3-Dichlorobenzene	180	27	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
1,4-Dichlorobenzene	9	6	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
2,4,5-Trichlorophenol	82000	6000	4.5 U	4.4 U	0.84 U	0.83 U	4.1 U	4.4 U	2.2 U	5.3 U	0.81 U
2,4,6-Trichlorophenol	180	72	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
2,4-Dichlorophenol	1300	130	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
2,4-Dimethylphenol	9800	910	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
2,4-Dinitrophenol	620	66			0.84 U	0.83 U	4.1 U	4.4 U		5.3 U	0.81 U
2,4-Dinitrotoluene	3.7	1.3	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 UJ	2.2 U	0.34 U
2,6-Dinitrotoluene	2.1	1	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
2-Chloronaphthalene	49000	4000	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
2-Chlorophenol	640	82	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
2-Methyl-4,6-Dinitrophenol	na	na	4.5 U	4.4 U	0.84 U	0.83 U	4.1 U	4.4 U	2.2 UJ	5.3 U	0.81 U
2-Methylnaphthalene	560	80	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
2-Methylphenol (o-Cresol)	28000	2400	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 UJ	0.89 U	2.2 U	0.34 U
2-Nitroaniline	66	5.7	4.5 U	4.4 U	0.84 UJ	0.83 U	4.1 U	4.4 U	2.2 U	5.3 U	0.81 UJ
2-Nitrophenol	na	na	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
3,3'-Dichlorobenzidine	6.3	2.1	3.7 U	3.7 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 UJ	0.34 U
3-Nitroaniline	na	na	4.5 U	4.4 U	0.84 U	0.83 U	4.1 U	4.4 U	2.2 U	5.3 U	0.81 U
4-Bromophenyl-phenylether	na	na	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
4-Chloro-3-methylphenol	4400	410	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
4-Chloroaniline	2000	190	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 UJ
4-Chlorophenylphenyl ether	na	na	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
4-Methylphenol (p-Cresol)	3000	250	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
4-Nitroaniline	56	5.2	4.5 U	4.4 U	0.84 U	0.83 UJ	4.1 U	4.4 U	2.2 U	5.3 UJ	0.81 U
4-Nitrophenol	4400	390	4.5 U	4.4 U	0.84 UJ	0.83 UJ	4.1 U	4.4 U	2.2 U	5.3 UJ	0.81 UJ
Acenaphthene	18000	1900	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Acenaphthylene	11000	1100	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Anthracene	260000	18000	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 UJ	2.2 U	0.34 U
Benzo(a)anthracene	5	1.4	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.14 J	2.2 U	0.34 U
Benzo(a)pyrene	0.5	0.1	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Benzo(b)fluoranthene	4.8	1.4	1.9 U	1.8 U	0.35 U	0.053 J	1.7 U	1.8 UJ	0.89 U	2.2 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S012401	030S012501	030S012602	030S012701	030S012801	030S012901	030S013001	030S013401 1	030S013501
Benzo(g,h,i)perylene	41000	2300	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Benzo(k)fluoranthene	52	15	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
bis(2-Chloroethoxy)methane	na	na	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
bis(2-Chloroethyl)ether	0.4	0.3	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	1.9 U	1.8 U	0.35 UJ	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 UJ
(BEHP)	280	76	1.9 U	1.8 U	0.78 U	0.18 J	1.7 U	1.8 U	0.89 U	2.2 U	0.039 U
Butylbenzylphthalate	320000	15000	1.9 U	1.8 U	0.35 U	0.047 U	1.7 U	1.8 U	0.89 UJ	2.2 U	0.34 UJ
Carbazole	190	53	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Chrysene	450	140	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Dibenz(a,h)anthracene	0.5	0.1	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Dibenzofuran	5000	280	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Diethylphthalate	920000	54000	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Dimethylphthalate	na	590000	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Di-n-butylphthalate	140000	7300	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 UJ	2.2 U	0.34 U
Di-n-octylphthalate	27000	1500	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 UJ	2.2 U	0.34 UJ
Fluoranthene	48000	2900	1.9 U	0.37 J	0.35 U	0.044 J	1.7 U	1.8 U	0.22 J	2.2 U	0.34 U
Fluorene	28000	2200	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Hexachlorobenzene	1.1	0.5	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Hexachlorobutadiene	12	6.3	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Hexachlorocyclopentadiene	16	2.4	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Hexachloroethane	78	34	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Isophorone	580	340	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 UJ
Naphthalene	270	40	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Nitrobenzene	120	14	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
N-Nitroso-di-n-propylamine	0.2	0.09	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
N-Nitrosodiphenylamine	440	170	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Pentachlorophenol	23	7.7	4.5 U	4.4 U	0.84 U	0.83 U	4.1 U	4.4 U	2.2 U	5.3 U	0.81 U
Phenanthrene	30000	2000	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Phenol	390000	900	1.9 U	1.8 U	0.35 U	0.34 U	1.7 U	1.8 U	0.89 U	2.2 U	0.34 U
Pyrene	37000	2200	1.9 U	0.25 J	0.35 U	0.034 J	1.7 U	1.8 U	0.19 J	2.2 U	0.34 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S013701	030S013801	030S013901	030S014001	030S014101	030S014201	030S014301	030S014401	030S014501
1,2,4-Trichlorobenzene	7500	560	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
1,2-Dichlorobenzene	4600	650	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
1,3-Dichlorobenzene	180	27	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
1,4-Dichlorobenzene	9	6	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2,4,5-Trichlorophenol	82000	6000	8.9 U	0.85 U	0.84 U	16 U	0.87 U	0.8 U	4.3 U	0.8 U	0.81 U
2,4,6-Trichlorophenol	180	72	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2,4-Dichlorophenol	1300	130	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2,4-Dimethylphenol	9800	910	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2,4-Dinitrophenol	620	66	8.9 UJ	0.85 UJ	0.84 U	16 UJ	0.87 U	0.8 U	4.3 UJ	0.8 U	0.81 UJ
2,4-Dinitrotoluene	3.7	1.3	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2,6-Dinitrotoluene	2.1	1	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2-Chloronaphthalene	49000	4000	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2-Chlorophenol	640	82	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2-Methyl-4,6-Dinitrophenol	na	na	8.9 U	0.85 U	0.84 U	16 U	0.87 U	0.8 U	4.3 U	0.8 U	0.81 U
2-Methylnaphthalene	560	80	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2-Methylphenol (o-Cresol)	28000	2400	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
2-Nitroaniline	66	5.7	8.9 U	0.85 UJ	0.84 UJ	16 U	0.87 U	0.8 U	4.3 U	0.8 U	0.33 U
2-Nitrophenol	na	na	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
3,3'-Dichlorobenzidine	6.3	2.1	3.7 UJ	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 UJ	0.33 U	0.33 UJ
3-Nitroaniline	na	na	8.9 U	0.85 U	0.84 U	16 U	0.87 U	0.8 U	4.3 U	0.8 U	0.81 U
4-Bromophenyl-phenylether	na	na	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
4-Chloro-3-methylphenol	4400	410	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
4-Chloroaniline	2000	190	3.7 U	0.35 U	0.35 UJ	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
4-Chlorophenylphenyl ether	na	na	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
4-Methylphenol (p-Cresol)	3000	250	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
4-Nitroaniline	56	5.2	8.9 U	0.85 UJ	0.84 U	16 U	0.87 UJ	0.8 UJ	4.3 U	0.8 UJ	0.81 U
4-Nitrophenol	4400	390	8.9 UJ	0.85 U	0.84 UJ	16 UJ	0.87 UJ	0.8 UJ	4.3 UJ	0.8 UJ	0.81 UJ
Acenaphthene	18000	1900	3.7 UJ	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Acenaphthylene	11000	1100	4.8	0.35 U	0.035 J	9.7	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Anthracene	260000	18000	3.3 J	0.35 U	0.35 U	7.6	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Benzo(a)anthracene	5	1.4	**2.5 J**	0.35 U	0.094 J	*** 22**	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Benzo(a)pyrene	0.5	0.1	*** 5**	0.35 U	0.087 J	*** 18**	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Benzo(b)fluoranthene	4.8	1.4	**4.6**	0.35 U	0.16 J	*** 16**	0.36 UJ	0.33 UJ	1.8 U	0.33 UJ	0.33 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S013701	030S013801	030S013901	030S014001	030S014101	030S014201	030S014301	030S014401	030S014501
Benzo(g,h,i)perylene	41000	2300	5.4	0.35 U	0.35 U	11	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Benzo(k)fluoranthene	52	15	4.2 J	0.35 U	0.093 J	**21**	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
bis(2-Chloroethoxy)methane	na	na	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
bis(2-Chloroethyl)ether	0.4	0.3	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	3.7 U	0.35 UJ	0.35 UJ	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
(BEHP)	280	76	1.8 J	0.2 J	0.27 U	6.7 U	0.36 U	1.2	1.8 U	0.047 J	0.33 U
Butylbenzylphthalate	320000	15000	0.48 J	0.35 U	0.35 UJ	6.7 U	0.055 J	0.33 U	1.8 U	0.33 U	0.33 U
Carbazole	190	53	3.7 U	0.35 U	0.35 U	1.2 J	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Chrysene	450	140	2.3 J	0.35 U	0.095 J	20	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Dibenz(a,h)anthracene	0.5	0.1	* **2.1 J**	0.35 U	0.35 U	* **5.9 J**	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Dibenzofuran	5000	280	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Diethylphthalate	920000	54000	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.063 J	1.8 U	0.33 U	0.33 U
Dimethylphthalate	na	590000	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Di-n-butylphthalate	140000	7300	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	1.2
Di-n-octylphthalate	27000	1500	3.7 U	0.35 U	0.35 UJ	6.7 U	0.36 U	0.33 U	1.8 UJ	0.33 U	0.33 UJ
Fluoranthene	48000	2900	2.3 J	0.35 U	0.16 J	44	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Fluorene	28000	2200	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Hexachlorobenzene	1.1	0.5	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Hexachlorobutadiene	12	6.3	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Hexachlorocyclopentadiene	16	2.4	3.7 UJ	0.35 U	0.35 U	6.7 UJ	0.36 U	0.33 U	1.8 UJ	0.33 U	0.33 UJ
Hexachloroethane	78	34	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	* **5.6**	0.35 U	0.35 U	* **13**	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Isophorone	580	340	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Naphthalene	270	40	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Nitrobenzene	120	14	3.7 U	0.35 U	0.35 UJ	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
N-Nitroso-di-n-propylamine	0.2	0.09	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
N-Nitrosodiphenylamine	440	170	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Pentachlorophenol	23	7.7	8.9 U	0.85 U	0.84 U	16 U	0.87 U	0.8 U	4.3 U	0.8 U	0.81 U
Phenanthrene	30000	2000	3.7 U	0.35 U	0.052 J	11	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Phenol	390000	900	3.7 U	0.35 U	0.35 U	6.7 U	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U
Pyrene	37000	2200	2.6 J	0.35 U	0.13 J	29	0.36 U	0.33 U	1.8 U	0.33 U	0.33 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S014701	030S014901	030S015001	030S015002	030S015101	030S015302	030S015402
1,2,4-Trichlorobenzene	7500	560	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
1,2-Dichlorobenzene	4600	650	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
1,3-Dichlorobenzene	180	27	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
1,4-Dichlorobenzene	9	6	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2,4,5-Trichlorophenol	82000	6000	4.2 U	4.2 U	4.1 U	0.82 U	1.8 U	0.85 U	4.3 U
2,4,6-Trichlorophenol	180	72	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2,4-Dichlorophenol	1300	130	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2,4-Dimethylphenol	9800	910	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2,4-Dinitrophenol	620	66	4.2 U				1.8 UJ	0.85 U	4.3 U
2,4-Dinitrotoluene	3.7	1.3	1.7 U	1.7 UJ	1.7 UJ	0.34 U	0.73 U	0.35 U	1.8 U
2,6-Dinitrotoluene	2.1	1	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2-Chloronaphthalene	49000	4000	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2-Chlorophenol	640	82	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2-Methyl-4,6-Dinitrophenol	na	na	4.2 UJ	4.2 UJ	4.1 UJ		1.8 U	0.85 U	4.3 U
2-Methylnaphthalene	560	80	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2-Methylphenol (o-Cresol)	28000	2400	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
2-Nitroaniline	66	5.7	4.2 U	4.2 U	4.1 U	0.82 U	1.8 UJ	0.85 UJ	4.3 UJ
2-Nitrophenol	na	na	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
3,3'-Dichlorobenzidine	6.3	2.1	3.5 U	1.7 U	1.7 U	0.68 U	0.73 U	0.35 U	1.8 U
3-Nitroaniline	na	na	4.2 U	4.2 U	4.1 U	0.82 U	1.8 U	0.85 U	4.3 U
4-Bromophenyl-phenylether	na	na	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
4-Chloro-3-methylphenol	4400	410	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
4-Chloroaniline	2000	190	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
4-Chlorophenylphenyl ether	na	na	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
4-Methylphenol (p-Cresol)	3000	250	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
4-Nitroaniline	56	5.2	4.2 U	4.2 UJ	4.1 U	0.82 U	1.8 UJ	0.85 U	4.3 U
4-Nitrophenol	4400	390		4.2 U	4.1 U	0.82 U	1.8 U	0.85 UJ	4.3 UJ
Acenaphthene	18000	1900	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Acenaphthylene	11000	1100	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Anthracene	260000	18000	1.7 U	1.7 U	1.7 UJ	0.34 U	0.73 U	0.35 U	1.8 U
Benzo(a)anthracene	5	1.4	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Benzo(a)pyrene	0.5	0.1	1.7 U	1.7 U	1.7 U	0.34 U	0.08 J	0.35 U	1.8 U
Benzo(b)fluoranthene	4.8	1.4	1.7 U	1.7 U	1.7 U	0.34 U	0.081 J	0.35 U	1.8 U

Table B-7: Summer of Surface Soil SVOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S014701	030S014901	030S015001	030S015002	030S015101	030S015302	030S015402
Benzo(g,h,i)perylene	41000	2300	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Benzo(k)fluoranthene	52	15	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 UJ
bis(2-Chloroethoxy)methane	na	na	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
bis(2-Chloroethyl)ether	0.4	0.3	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Bis(2-Chloroisopropyl)Ether	7.3	4.4	1.7 U	1.7 U	1.7 U	0.34 U	0.73 UJ	0.35 UJ	1.8 U
(BEHP)	280	76	1.7 U	1.7 U	1.7 U	0.35	0.14 J	0.95 U	1.8 U
Butylbenzylphthalate	320000	15000	1.7 UJ	1.7 U	1.7 UJ	0.34 U	0.73 U	0.35 U	1.8 U
Carbazole	190	53	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Chrysene	450	140	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Dibenz(a,h)anthracene	0.5	0.1	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Dibenzofuran	5000	280	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Diethylphthalate	920000	54000	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Dimethylphthalate	na	590000	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Di-n-butylphthalate	140000	7300	1.7 UJ	1.7 UJ	1.7 UJ	0.34 U	0.73 U	0.35 U	1.8 U
Di-n-octylphthalate	27000	1500	1.7 UJ	1.7 U	1.7 UJ	0.34 U	0.73 U	0.35 U	1.8 U
Fluoranthene	48000	2900	1.7 U	1.7 U	1.7 UJ	0.34 U	0.16 J	0.35 U	1.8 U
Fluorene	28000	2200	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Hexachlorobenzene	1.1	0.5	1.7 U	1.7 UJ	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Hexachlorobutadiene	12	6.3	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Hexachlorocyclopentadiene	16	2.4	1.7 U	1.7 UJ	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Hexachloroethane	78	34	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Indeno(1,2,3-cd)pyrene	5.3	1.5	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Isophorone	580	340	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Naphthalene	270	40	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Nitrobenzene	120	14	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
N-Nitroso-di-n-propylamine	0.2	0.09	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
N-Nitrosodiphenylamine	440	170	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Pentachlorophenol	23	7.7	4.2 U	4.2 U	4.1 U	0.82 UJ	1.8 U	0.85 U	4.3 U
Phenanthrene	30000	2000	1.7 U	1.7 U	1.7 U	0.34 U	0.08 J	0.35 U	1.8 U
Phenol	390000	900	1.7 U	1.7 U	1.7 U	0.34 U	0.73 U	0.35 U	1.8 U
Pyrene	37000	2200	1.7 U	1.7 U	1.7 U	0.34 U	0.14 J	0.35 U	1.8 U

Table B-8: Summary of Subsurface SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Leachability Based SCTL	011SLF1206		025S001014		025S11214		027S001706		030S000608		030S001212	
		1993	2003	1993	2003	1993	2003	1993	2003	1993	2003	1993	2003
1,2,4-Trichlorobenzene	5300	54000 U	44 U	340 U	41 U	350 U	40 U	350 U	40 U	350 U	42 U	340 U	40 U
1,2-Dichlorobenzene	17000	54000 U	26 U	340 U	25 U	350 U	24 U	350 U	24 U	350 U	26 U	340 U	24 U
1,3-Dichlorobenzene	300	54000 U	26 U	340 U	25 U	350 U	24 U	350 U	24 U	350 U	26 U	340 U	24 U
1,4-Dichlorobenzene	2200	54000 U	28 U	340 U	26 U	350 U	26 U	350 U	26 U	350 U	27 U	340 U	25 U
1-Methyl naphthalene	2200	na	1700 D	na	0.38 U	na	0.42	na	0.37 U	na	0.43	na	0.37 U
2,2'-oxybis(1-Chloropropane)	NA	na	37 U	na	34 U	na	34 U	na	34 U	na	36 U	na	34 U
2,4,5-Trichlorophenol	300	140000 U	36 U	820 U	33 U	840 U	33 U	840 U	33 U	840 U	34 U	840 U	33 U
2,4,6-Trichlorophenol	60	54000 U	37 U	340 U	34 U	350 U	34 U	350 U	34 U	350 U	36 U	340 U	34 U
2,4-Dichlorophenol	5	54000 U	33 U	340 U	31 U	350 U	31 U	350 U	31 U	350 U	32 U	340 U	30 U
2,4-Dimethylphenol	1700	54000 U	32 U	340 U	30 U	350 U	30 U	350 U	30 U	350 U	31 U	340 U	29 U
2,4-Dinitrophenol	60	140000 UJ	390 U	820 U	360 U	840 U	360 U	840 U	360 U	840 U	380 U	840 U	360 U
2,4-Dinitrotoluene	0.80	54000 U	25 U	340 U	24 U	350 U	23 U	350 U	23 U	350 U	24 U	340 U	23 U
2,6-Dinitrotoluene	0.7	54000 U	33 U	340 U	31 U	350 U	31 U	350 U	31 U	350 U	32 U	340 U	30 U
2-Chloronaphthalene	260000	54000 U	42 U	340 U	40 U	350 U	39 U	350 U	39 U	350 U	41 U	340 U	39 U
2-Chlorophenol	700	54000 U	47 U	340 U	44 U	350 U	44 U	350 U	44 U	350 U	46 U	340 U	43 U
2-Methyl-4,6-Dinitrophenol	NA	140000 UJ	36 U	820 U	33 U	840 U	33 U	840 U	33 U	840 U	34 U	840 U	33 U
2-Methylnaphthalene	6100	**24000** J	2600 D	340 U	0.57 U	350 U	0.6	350 U	0.56 U	350 U	0.59 U	340 U	0.56 U
2-Methylphenol (o-Cresol)	300	54000 U	53 U	340 U	49 U	350 U	49 U	350 U	49 U	350 U	51 U	340 U	48 U
2-Nitroaniline	300	140000 U	29 U	820 U	27 U	840 U	26 U	840 U	26 U	840 UJ	28 U	840 U	26 U
2-Nitrophenol	NA	54000 U	30 U	340 U	28 U	350 U	28 U	350 U	28 U	350 U	29 U	340 U	27 U
3,3'-Dichlorobenzidine	400	54000 UJ	30 U	340 U	28 U	350 U	28 U	350 U	28 U	350 UJ	29 U	340 U	27 U
3-Methylphenol/4-Methylphenol	30	na	46 U	na	43 U	na	42 U	na	42 U	na	44 U	na	42 U
3-Nitroaniline	100	140000 U	34 U	820 U	32 U	840 U	32 U	840 U	32 U	840 U	33 U	840 UJ	32 U
4-Bromophenyl-phenylether	NA	54000 U	34 U	340 U	32 U	350 U	32 U	350 U	32 U	350 U	33 U	340 U	32 U
4-Chloro-3-methylphenol	400	54000 U	46 U	340 U	43 U	350 U	42 U	350 U	42 U	350 U	44 U	340 U	42 U
4-Chloroaniline	200	54000 U	33 U	340 U	31 U	350 U	31 U	350 U	31 U	350 U	32 U	340 U	30 U
4-Chlorophenylphenyl ether	NA	54000 U	30 U	340 U	28 U	350 U	28 U	350 U	28 U	350 U	29 U	340 U	27 U
4-Methylphenol (p-cresol)	30	54000 U	na	340 U	na	350 U	na	**130** J	na	350 U	na	340 U	na
4-Nitroaniline	100	140000 U	30 U	820 U	28 U	840 U	28 U	840 U	28 U	840 UJ	29 U	840 U	27 U
4-Nitrophenol	300	140000 U	29 U	820 U	27 U	840 U	26 U	840 U	26 U	840 U	28 U	840 U	26 U
Acenaphthene	2100	54000 U	1.1 U	340 U	0.97 U	350 U	0.96 U	350 U	0.96 U	350 U	1 U	340 U	0.95 U
Acenaphthylene	27000	54000 U	1 U	340 U	0.92 U	350 U	0.91 U	350 U	0.91 U	350 U	24	340 U	0.9 U
Anthracene	2500000	54000 U	15	340 U	1 U	350 U	1 U	350 U	1 U	350 U	18	340 U	1 U
Benzo(a)anthracene	3200	54000 U	0.92 U	340 U	0.82 U	350 U	0.81 U	350 U	0.81 U	350 U	140	340 U	1
Benzo(a)pyrene	8000	54000 U	1.1 U	340 U	0.97 U	350 U	0.96 U	350 U	0.96 U	350 U	190	340 U	1.6
Benzo(b)fluoranthene	10000	54000 U	1.2 U	340 U	1 U	350 U	1 U	350 U	1 U	350 U	310	340 U	2
Benzo(g,h,i)perylene	32000000	54000 U	29	340 U	0.66 U	350 U	0.65 U	350 U	0.65 U	350 U	250	340 U	2.3
Benzo(k)fluoranthene	25000	54000 UJ	1.2 U	340 U	1 U	350 U	1 U	350 U	1 U	350 U	240	340 U	1.6
bis(2-Chloroethoxy)methane	NA	54000 U	37 U	340 U	34 U	350 U	34 U	350 U	34 U	350 U	36 U	340 U	34 U
bis(2-Chloroethyl)ether	20	54000 U	42 U	340 U	40 U	350 U	39 U	350 U	39 U	350 U	41 U	340 U	39 U
bis(2-chloroisopropyl)ether	70	54000 U	na	340 U	na	350 U	na	350 U	na	350 UJ	na	340 U	na
bis(2-Ethylhexyl)phthalate (BEHP)	3600000	54000 UJ	88	340 U	47 U	350 U	47 U	350 U	47 U	350 U	49 U	750 J	46 U
Butylbenzylphthalate	310000	54000 UJ	37 U	340 U	34 U	350 U	34 U	350 U	34 U	350 U	36 U	340 U	34 U
Carbazole	600	54000 UJ	34 U	340 U	32 U	350 U	32 U	350 U	32 U	350 U	100	340 U	32 U
Chrysene	77000	54000 U	1.2 U	340 U	1.1 U	350 U	1.1 U	350 U	1.1 U	350 U	180	340 U	1.1
Dibenz(a,h)anthracene	30000	54000 UJ	1.1 U	340 U	0.95 U	350 U	0.94 U	350 U	0.94 U	350 U	47	340 U	0.93 U
Dibenzofuran	15000	54000 U	39 U	340 U	36 U	350 U	36 U	350 U	36 U	350 U	38 U	340 U	36 U
Diethylphthalate	86000	54000 U	40 U	340 U	38 U	350 U	37 U	350 U	37 U	350 U	39 U	340 U	37 U
Dimethylphthalate	380000	54000 U	40 U	340 U	38 U	350 U	37 U	350 U	37 U	350 U	39 U	340 U	37 U
Di-n-butylphthalate	47000	54000 U	45 U	340 U	42 U	350 U	41 U	350 U	41 U	350 U	43 U	340 U	41 U
Di-n-octylphthalate	480000000	54000 UJ	37 U	340 U	34 U	350 U	34 U	350 U	34 U	350 U	36 U	340 U	34 U
Fluoranthene	1200000	54000 U	30	340 U	0.92 U	350 U	0.91 U	350 U	0.91 U	350 U	520	340 U	1.7
Fluorene	160000	54000 U	0.94 U	340 U	0.84 U	350 U	0.83 U	350 U	0.83 U	350 U	1.5	340 U	0.82 U
Hexachlorobenzene	2200	54000 U	44 U	340 U	41 U	350 U	40 U	350 U	40 U	350 U	42 U	340 U	40 U
Hexachlorobutadiene	1100	54000 U	31 U	340 U	29 U	350 U	29 U	350 U	29 U	**350** J	30 U	340 U	28 U

Table B-8: Summary of Subsurface SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Leachability Based SCTL	011SLF1206		025S001014		025S11214		027S001706		030S000608		030S001212	
		1993	2003	1993	2003	1993	2003	1993	2003	1993	2003	1993	2003
Hexachlorocyclopentadiene	400000	54000 UJ	310 U	340 U	290 U	350 U	290 U	350 U	290 U	350 U	300 U	340 U	280 U
Hexachloroethane	200	54000 U	22 U	340 U	20 U	350 U	20 U	350 U	20 U	350 U	21 U	340 U	20 U
Indeno(1,2,3-cd)pyrene	28000	54000 U	0.78 U	340 U	0.7 U	350 U	0.69 U	350 U	0.69 U	350 U	97	340 U	0.75
Isophorone	200	54000 U	30 U	**340**	28 U	350 U	28 U	350 U	28 U	350 U	29 U	340 U	27 U
Naphthalene	1700	**14000** J	1300 D	340 U	0.76 U	350 U	0.76 U	36 J	0.76 U	**150** J	0.79 U	340 U	0.75 U
Nitrobenzene	30	54000 U	36 U	340 U	33 U	350 U	33 U	350 U	33 U	350 U	34 U	340 U	33 U
N-Nitroso-di-n-propylamine	40	54000 U	34 U	340 U	32 U	350 U	32 U	350 U	32 U	350 U	33 U	340 U	32 U
N-Nitrosodiphenylamine	400	54000 U	34 U	340 U	32 U	350 U	32 U	350 U	32 U	350 U	33 U	340 U	32 U
Pentachlorophenol	30	140000 U	39 U	820 U	36 U	**47** J	36 U	840 U	36 U	840 U	38 U	840 U	36 U
Phenanthrene	250000	54000 U	110	340 U	0.86 U	350 U	0.85 U	350 U	0.85 U	350 U	150	340 U	0.84 U
Phenol	50	54000 U	47 U	340 U	44 U	350 U	44 U	**66** J	44 U	350 U	46 U	340 U	43 U
Pyrene	880000	54000 U	87	340 U	1.3 U	350 U	1.3 U	350 U	1.3 U	350 U	370	340 U	1.7

Notes:
All concentrations expressed in micrograms per kilogram
Bolding indicates the value exceeds the SCTL
Blank cells indicate that the sample was not collected or analyzed for that parameter
na - not analyzed
U - not detected
J - present below the method detection limit but above the instrument detection limit

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	11GI08		11GS07		11GS09		11GS13		11GS16	11GS47	
				1993	2003	1993	2003	1993	2003	1993	2003	2003	1993	2003
1,2,4-Trichlorobenzene	70	23	23	10 U	0.51 U	10 U	0.51 U	10 U	0.51 U	10 U	0.51 U	0.51 U	10 U	0.51 U
1,2-Dichlorobenzene	600	99	99	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
1,3-Dichlorobenzene	230	85	85	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
1,4-Dichlorobenzene	75	3.3	3.3	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
1-Methyl naphthalene	15	95	95	na	0.028 U	na	0.028 U	na	0.42	na	0.028 U	0.028 U	na	**28**
2,2'-oxybis(1-Chloropropane)	NA	NA	NA	na	0.58 U	na	0.58 U	na	0.58 U	na	0.58 U	0.58 U	na	0.58 U
2,4,5-Trichlorophenol	1	23	23	25 U	1.1 U	25 U	1.1 U	25 U	1.1 U	25 U	1.1 U	1.1 U	25 U	1.1 U
2,4,6-Trichlorophenol	3.5	6.5	6.5	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	1.1 U	10 U	1.1 U
2,4-Dichlorophenol	0.3	13	13	10 U	0.76 U	10 U	0.76 U	10 U	0.76 U	10 U	0.76 U	0.76 U	10 U	0.76 U
2,4-Dimethylphenol	150	160	160	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	1.1 U	10 U	1.1 U
2,4-Dinitrophenol	15	3	3	25 UJ	10 U	25 U	10 U	25 U	10 U	25 UR	10 U	10 U	25 U	10 U
2,4-Dinitrotoluene	0.06	9.1	9.1	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	1.1 U	10 U	1.1 U
2,6-Dinitrotoluene	0.06	0.8	0.8	10 U	0.87 U	10 U	0.87 U	10 U	0.87 U	10 U	0.87 U	0.87 U	10 U	0.87 U
2-Chloronaphthalene	610	1700	1700	10 U	1 U	10 U	1 U	4 J	2.8 J	10 U	1 U	1 U	10 U	1 U
2-Chlorophenol	38	130	130	10 U	0.79 U	10 U	0.79 U	10 U	0.79 U	10 U	0.79 U	0.79 U	10 U	0.79 U
2-Methyl-4,6-Dinitrophenol	NA	NA	NA	25 U	10 U	25 U	10 U	25 U	10 U	25 UJ	10 U	10 U	25 U	10 U
2-Methylnaphthalene	15	30	30	10 U	0.022 U	10 U	0.022 U	10 U	0.05 J	10 U	0.022 U	0.022 U	**25**	**39**
2-Methylphenol (o-Cresol)	38	250	250	10 U	0.59 U	10 U	0.59 U	10 U	0.59 U	10 U	0.59 U	0.59 U	10 U	0.59 U
2-Nitroaniline	23	NA	NA	25 U	0.72 U	25 U	0.72 U	25 U	0.72 U	25 U	0.72 U	0.72 U	25 U	0.72 U
2-Nitrophenol	NA	NA	NA	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	1.1 U	10 U	1.1 U
3,3'-Dichlorobenzidine	0.08	0.03	0.03	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
3-Methylphenol/4-Methylphenol	3.8	70	70	na	1 U	na	1 U	na	1 U	na	1 U	1 U	na	1 U
3-Nitroaniline	1.8	NA	NA	25 U	0.64 U	25 UJ	0.64 U	25 U	0.64 U	25 U	0.64 U	0.64 U	25 UJ	0.64 U
4-Bromophenyl-phenylether	NA	NA	NA	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
4-Chloro-3-methylphenol	68	100	100	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
4-Chloroaniline	30	2.5	2.5	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
4-Chlorophenylphenyl ether	NA	NA	NA	10 U	0.7 U	10 U	0.7 U	10 U	0.7 U	10 U	0.7 U	0.7 U	10 U	0.7 U
4-Methylphenol (p-Cresol)	3.8	70	70	10 U	na	10 U	na	10 U	na	10 U	na	na	10 U	na
4-Nitroaniline	1.8	1200	1200	25 U	0.86 U	25 U	0.86 U	25 U	0.86 U	25 U	0.86 U	0.86 U	25 U	0.86 U
4-Nitrophenol	61	55	55	25 U	5 U	25 U	5 U	25 U	5 U	25 U	5 U	5 U	25 U	5 U
Acenaphthene	20	3	3	10 U	0.025 U	10 U	0.025 U	1 J	0.92	10 U	0.093	0.025 U	10 U	0.12 U
Acenaphthylene	230	**	**	10 U	0.024 U	10 U	0.024 U	10 U	0.059 J	10 U	0.024 U	0.024 U	10 U	0.12 U
Anthracene	2300	0.3	0.3	10 U	0.031 U	10 U	0.031 U	10 U	0.057 J	10 U	0.031 U	0.031 U	10 U	0.16 U
Benzo(a)anthracene	0.05	**	**	10 U	0.07 U	10 U	0.07 U	10 U	0.07 U	10 U	0.07 U	0.07 U	10 U	0.35 U
Benzo(a)pyrene	0.2	**	**	10 U	0.06 U	10 U	0.06 U	10 U	0.06 U	10 U	0.06 U	0.06 U	10 U	0.3 U
Benzo(b)fluoranthene	0.05	**	**	10 U	0.074 U	10 U	0.074 U	10 U	0.074 U	10 U	0.074 U	0.074 U	10 U	0.37 U
Benzo(g,h,i)perylene	230	**	**	10 U	0.096 U	10 U	0.096 U	10 U	0.14 J	10 U	0.096 U	0.096 U	10 U	0.48 U
Benzo(k)fluoranthene	0.5	**	**	10 U	0.058 U	10 U	0.058 U	10 U	0.058 U	10 U	0.058 U	0.058 U	10 U	0.29 U
bis(2-Chloroethoxy)methane	NA	NA	NA	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
bis(2-Chloroethyl)ether	0.03	0.6	0.6	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
Bis(2-Chloroisopropyl)Ether	0.5	25	25	10 U	na	10 U	na	10 U	na	10 U	na	na	10 U	na
bis(2-Ethylhexyl)phthalate (BEHP)	6	2.4	2.4	10 U	2.4 U	10 U	2.4 U	10 U	2.4 U	1 J	2.4 U	2.4 U	2 J	2.4 U
Butylbenzylphthalate	150	26	26	10 U	0.74 U	10 U	0.74 U	10 U	0.74 U	10 U	0.74 U	0.74 U	10 U	0.74 U
Carbazole	1.9	47	47	10 U	0.54 U	10 U	0.54 U	10 U	0.54 U	10 U	0.54 U	0.54 U	10 U	0.54 U
Chrysene	5.2	**	**	10 U	0.088 U	10 U	0.088 U	10 U	0.088 U	10 U	0.088 U	0.088 U	10 U	0.44 U
Dibenz(a,h)anthracene	0.005	**	**	10 U	0.065 U	10 U	0.065 U	10 U	0.065 U	10 U	0.065 U	0.065 U	10 U	0.32 U
Dibenzofuran	30	67	67	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
Diethylphthalate	6100	380	380	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
Dimethylphthalate	76000	1400	1400	10 U	0.57 U	10 U	0.57 U	10 U	0.57 U	10 U	0.57 U	0.57 U	10 U	0.57 U
Di-n-butylphthalate	NA	NA	NA	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
Di-n-octylphthalate	150	NA	NA	10 U	1.2 U	10 U	1.2 U	10 U	1.2 U	10 U	1.2 U	1.2 U	10 U	1.2 U
Diphenylamine	190	NA	NA	na	na	na	na	na	na	na	na	na	na	na
Fluoranthene	300	0.3	0.3	10 U	0.061 U	10 U	0.061 U	10 U	0.12 J	10 U	0.061 U	0.061 U	10 U	0.3 U
Fluorene	300	30	30	10 U	0.026 U	10 U	0.026 U	10 U	0.15 J	10 U	0.026 U	0.026 U	10 U	0.61
Hexachlorobenzene	1	0.0003	0.0003	10 U	0.61 U	10 U	0.61 U	10 U	0.61 U	10 U	0.61 U	0.61 U	10 U	0.61 U
Hexachlorobutadiene	0.5	49.7	49.7	10 U	0.5 U	10 U	0.5 U	10 U	0.5 U	10 U	0.5 U	0.5 U	10 U	0.5 U
Hexachlorocyclopentadiene	50	3	3	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	1.1 U	10 U	1.1 U
Hexachloroethane	2.7	3.6	3.6	10 U	0.7 U	10 U	0.7 U	10 U	0.7 U	10 U	0.7 U	0.7 U	10 U	0.7 U
Indeno(1,2,3-cd)pyrene	0.05	**	**	10 U	0.08 U	10 U	0.08 U	10 U	0.08 U	10 U	0.08 U	0.08 U	10 U	0.4 U
Isophorone	40	650	650	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
Naphthalene	15	26	26	10 U	0.028 U	10 U	0.028 U	10 U	0.093 U	10 U	0.028 U	0.028 U	**47**	5.2

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	11GI08		11GS07		11GS09		11GS13		11GS16	11GS47	
				1993	2003	1993	2003	1993	2003	1993	2003	2003	1993	2003
Nitrobenzene	3.8	90	90	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
N-Nitroso-di-n-propylamine	0.005	0.5	0.5	10 U	1 U	10 UJ	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
N-Nitrosodiphenylamine	7.8	6.5	6.5	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	1 U	10 U	1 U
Pentachlorophenol	1	8.2	8.2	25 U	2 U	25 U	2 U	25 U	2 U	25 U	2 U	2 U	25 U	2 U
Phenanthrene	230	**	**	10 U	0.025 U	10 U	0.025 U	10 U	0.046 J	10 U	0.025 U	0.025 U	10 U	0.23
Phenol	10	6.5	6.5	10 U	1 U	10 U	1 U	10 U	1 U	14 U	1 U	1 U	10 U	1 U
Pyrene	230	0.3	0.3	10 U	0.042 U	10 U	0.042 U	10 U	0.13 J	10 U	0.042 U	0.044	10 U	0.21 U

Notes:
All concentrations expressed in micrograms per kilogram
Bolding indicates an exceedance of CTL.
** = FSWCTL & MSWCTL for total PAHs = 0.031 ug/L
1 = more conservative 4-methylphenol criteria used over 3-methylphenol
J - present below the method detection limit but above the instrument detection limit
U - not detected
NA - not applicable
na - not analyzed

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	12GS14 1995	12GS14 2003	27GS06 1993	27GS06 1995	27GS06 2003	27GS17 2003	27GS18 1993	27GS18 1995	27GS18 2003	27GS19 1993	27GS19 1995	27GS19 2003
1,2,4-Trichlorobenzene	70	23	23	5 U	0.51 U	10 U	10 U	0.51 U	0.51 U	10 U	10 U	0.51 U	20 U	10 U	0.51 U
1,2-Dichlorobenzene	600	99	99	na	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
1,3-Dichlorobenzene	230	85	85	na	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
1,4-Dichlorobenzene	75	3.3	3.3	na	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
1-Methyl naphthalene	15	95	95	na	0.028 U	na	na	0.028 U	0.21	na	na	5	na	na	8.5
2,2'-oxybis(1-Chloropropane)	NA	NA	NA	na	0.58 U	na	na	0.58 U	0.58 U	na	na	0.58 U	na	na	0.58 U
2,4,5-Trichlorophenol	1	23	23	20 U	1.1 U	25 U	25 U	1.1 U	1.1 U	25 U	4 U	1.1 U	50 U	4 U	1.1 U
2,4,6-Trichlorophenol	3.5	6.5	6.5	5 U	1.1 U	10 U	10 U	1.1 U	1.1 U	10 U	10 U	1.1 U	20 U	10 U	1.1 U
2,4-Dichlorophenol	0.3	13	13	5 U	0.76 U	10 U	10 U	0.76 U	0.76 U	10 U	4 U	0.76 U	20 U	4 U	0.76 U
2,4-Dimethylphenol	150	160	160	5 U	1.1 U	10 U	10 U	1.1 U	1.1 U	2 J	10 U	1.1 U	8 J	10 U	1.1 U
2,4-Dinitrophenol	15	3	3	20 U	10 U	25 U	25 U	10 U	10 U	25 U	25 UJ	10 U	50 U	25 UJ	10 U
2,4-Dinitrotoluene	0.06	9.1	9.1	5 U	1.1 U	10 U	10 U	1.1 U	1.1 U	10 U	10 U	1.1 U	20 U	10 U	1.1 U
2,6-Dinitrotoluene	0.06	0.8	0.8	5 U	0.87 U	10 U	10 U	0.87 U	0.87 U	10 U	10 U	0.87 U	20 U	10 U	0.87 U
2-Chloronaphthalene	610	1700	1700	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
2-Chlorophenol	38	130	130	5 U	0.79 U	10 U	10 U	0.79 U	0.79 U	10 U	10 U	0.79 U	20 U	10 U	0.79 U
2-Methyl-4,6-Dinitrophenol	NA	NA	NA	20 U	10 U	25 U	25 U	10 U	10 U	25 U	25 U	10 U	50 U	25 U	10 U
2-Methylnaphthalene	15	30	30	5 U	0.022 U	10 U	10 U	0.022 U	0.44	7 J	4.5 J	7.3	**28**	6.3 J	12
2-Methylphenol (o-Cresol)	38	250	250	5 U	0.59 U	10 U	10 U	0.59 U	0.59 U	10 U	10 U	0.59 U	20 U	10 U	0.59 U
2-Nitroaniline	23	NA	NA	20 U	0.72 U	25 U	25 U	0.72 U	0.72 U	25 U	7.5 U	0.72 U	50 U	7.5 U	0.72 U
2-Nitrophenol	NA	NA	NA	5 U	1.1 U	10 U	10 U	1.1 U	1.1 U	10 U	10 U	1.1 U	20 U	10 U	1.1 U
3,3'-Dichlorobenzidine	0.08	0.03	0.03	5 J	1 U	10 U	10 U	1 U	1 U	10 U	14 U	1 U	20 U	14 U	1 U
3-Methylphenol/4-Methylphenol	3.8	70	70	na	1 U	na	na	1 U	1 U	na	10 U	**29**	na	**20**	**110**
3-Nitroaniline	1.8	NA	NA	20 U	0.64 U	25 U	25 U	0.64 U	0.64 U	25 U	25 U	0.64 U	50 U	25 U	0.64 U
4-Bromophenyl-phenylether	NA	NA	NA	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
4-Chloro-3-methylphenol	68	100	100	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
4-Chloroaniline	30	2.5	2.5	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
4-Chlorophenylphenyl ether	NA	NA	NA	5 U	0.7 U	10 U	10 U	0.7 U	0.7 U	10 U	10 U	0.7 U	20 U	10 U	0.7 U
4-Methylphenol (p-Cresol)	3.8	70	70	5 U	na	10 U	10 U	na	na	**4** J	na	na	**30**	na	na
4-Nitroaniline	1.8	1200	1200	20 U	0.86 U	25 U	25 U	0.86 U	0.86 U	25 U	25 U	0.86 U	50 U	25 U	0.86 U
4-Nitrophenol	61	55	55	20 U	5 U	25 U	25 U	5 U	5 U	25 U	15 U	5 U	50 U	15 UJ	5 U
Acenaphthene	20	3	3	5 U	0.025 U	10 U	10 U	0.025 U	0.028	10 U	10 U	0.025 U	20 U	10 U	0.091
Acenaphthylene	230	**	**	5 U	0.024 U	10 U	10 U	0.024 U	0.13	10 U	10 U	0.024 U	20 U	10 U	0.22
Anthracene	2300	0.3	0.3	5 U	0.031 U	10 U	10 U	0.031 U	0.031 U	10 U	10 U	0.031 U	20 U	10 U	0.039 U
Benzo(a)anthracene	0.05	**	**	5 U	0.07 U	10 U	10 U	0.07 U	0.07 U	10 U	4 U	0.07 U	20 U	4 U	0.089 U
Benzo(a)pyrene	0.2	**	**	5 U	0.06 U	10 U	10 U	0.06 U	0.06 U	10 U	0.59 U	0.06 U	20 U	0.59 U	0.076 U
Benzo(b)fluoranthene	0.05	**	**	5 U	0.074 U	10 U	10 U	0.074 U	0.074 U	10 U	4 U	0.074 U	20 U	4 U	0.094 U
Benzo(g,h,i)perylene	230	**	**	5 U	0.096 U	10 U	10 U	0.096 U	0.096 U	10 U	10 U	0.096 U	20 U	10 UJ	0.12 U
Benzo(k)fluoranthene	0.5	**	**	5 U	0.058 U	10 U	10 U	0.058 U	0.058 U	10 U	4 U	0.058 U	20 U	4 U	0.073 U
bis(2-Chloroethoxy)methane	NA	NA	NA	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
bis(2-Chloroethyl)ether	0.03	0.6	0.6	5 U	1 U	10 U	10 U	1 U	1 U	10 U	1.5 U	1 U	20 U	1.5 U	1 U
Bis(2-Chloroisopropyl)Ether	0.5	25	25	5 U	na	10 U	10 U	na	na	10 U	7.5 U	na	20 U	7.5 U	na
bis(2-Ethylhexyl)phthalate (BEHP)	6	2.4	2.4	5 U	2.4 U	10 U	10 U	2.4 U	2.4 U	10 U	2 J	2.4 U	20 U	**7.7** J	2.4 U
Butylbenzylphthalate	150	26	26	5 U	0.74 U	10 U	10 U	0.74 U	0.74 U	10 U	10 U	0.74 U	20 U	0.99 J	0.74 U
Carbazole	1.9	47	47	na	0.54 U	10 U	10 U	0.54 U	0.54 U	10 U	7.5 U	0.54 U	20 U	7.5 U	0.54 U
Chrysene	5.2	**	**	5 U	0.088 U	10 U	10 U	0.088 U	0.088 U	10 U	5 U	0.088 U	20 U	5 U	0.11 U
Dibenz(a,h)anthracene	0.005	**	**	5 U	0.065 U	10 U	10 U	0.065 U	0.065 U	10 U	7.5 U	0.065 U	20 U	7.5 U	0.082 U
Dibenzofuran	30	67	67	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
Diethylphthalate	6100	380	380	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
Dimethylphthalate	76000	1400	1400	5 U	0.57 U	10 U	10 U	0.57 U	0.57 U	10 U	10 U	0.57 U	20 U	10 U	0.57 U
Di-n-butylphthalate	NA	NA	NA	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	0.41 J	1 U
Di-n-octylphthalate	150	NA	NA	5 U	1.2 U	10 U	10 U	1.2 U	1.2 U	10 U	10 U	1.2 U	20 U	0.22 J	1.2 U
Diphenylamine	190	NA	NA	na	na	na	na	na	na	na	7 U	na	na	7 U	na
Fluoranthene	300	0.3	0.3	5 U	0.061 U	10 U	10 U	0.061 U	0.061 U	10 U	10 U	0.061 U	20 U	10 U	0.077 U
Fluorene	300	30	30	5 U	0.026 U	10 U	10 U	0.026 U	0.026 U	10 U	10 U	0.026 U	20 U	10 U	0.033 U
Hexachlorobenzene	1	0.0003	0.0003	5 U	0.61 U	10 U	10 U	0.61 U	0.61 U	10 U	1 U	0.61 U	20 U	1 U	0.61 U
Hexachlorobutadiene	0.5	49.7	49.7	5 U	0.5 U	10 U	10 U	0.5 U	0.5 U	10 U	10 U	0.5 U	20 U	10 U	0.5 U
Hexachlorocyclopentadiene	50	3	3	5 U	1.1 U	10 U	10 U	1.1 U	1.1 U	10 U	10 U	1.1 U	20 U	10 U	1.1 U
Hexachloroethane	2.7	3.6	3.6	5 U	0.7 U	10 U	10 U	0.7 U	0.7 U	10 U	10 U	0.7 U	20 U	10 U	0.7 U
Indeno(1,2,3-cd)pyrene	0.05	**	**	5 U	0.08 U	10 U	10 U	0.08 U	0.08 U	10 U	7.5 U	0.08 U	20 U	7.5 U	0.1 U
Isophorone	40	650	650	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
Naphthalene	15	26	26	5 U	0.028 U	10 U	10 U	0.028 U	0.095 U	**34**	**49**	**47** D	**110**	**50**	**150** D

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	12GS14		27GS06			27GS17	27GS18			27GS19		
				1995	2003	1993	1995	2003	2003	1993	1995	2003	1993	1995	2003
Nitrobenzene	3.8	90	90	5 U	1 U	10 U	10 U	1 U	1 U	10 U	9.5 U	1 U	20 U	9.5 U	1 U
N-Nitroso-di-n-propylamine	0.005	0.5	0.5	5 U	1 U	10 U	10 U	1 U	1 U	10 U	4 U	1 U	20 U	4 U	1 U
N-Nitrosodiphenylamine	7.8	6.5	6.5	5 U	1 U	10 U	10 U	1 U	1 U	10 U	na	1 U	20 U	na	1 U
Pentachlorophenol	1	8.2	8.2	20 U	2 U	25 U	25 U	2 U	2 U	25 U	1 U	2 U	50 U	**1.7** J	2 U
Phenanthrene	230	**	**	5 U	0.025 U	10 U	10 U	0.025 U	0.025 U	10 U	10 U	0.025 U	20 U	10 U	0.032 U
Phenol	10	6.5	6.5	5 U	1 U	10 U	10 U	1 U	1 U	10 U	10 U	1 U	20 U	10 U	1 U
Pyrene	230	0.3	0.3	5 U	0.042 U	10 U	10 U	0.042 U	0.051	10 U	10 U	0.046	20 U	10 U	0.053 U

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	27GS20			30GI111			30GI126		30GI164		30GMW03	
				1993	1995	2003	1993	1995	2003	1993	2003	1993	2003	1993	2003
1,2,4-Trichlorobenzene	70	23	23	10 U	10 U	0.77 J	12 U	10 U	0.51 U	10 U	0.51 U	11 U	0.54 J	11 U	0.51 U
1,2-Dichlorobenzene	600	99	99	10 U	10 U	1 U	39	42	38	10 U	1 U	11 U	3.6 J	11 U	1 U
1,3-Dichlorobenzene	230	85	85	10 U	10 U	1 U	37	37	32	10 U	1 U	11 U	1 U	11 U	1 U
1,4-Dichlorobenzene	75	3.3	3.3	10 U	10 U	1 U	**180** J	**140** D	**100**	10 U	1 U	11 U	1.3 J	11 U	1 U
1-Methyl naphthalene	15	95	95	na	na	0.54	na	na	0.028 U	na	0.028 U	na	0.028 U	na	0.028 U
2,2'-oxybis(1-Chloropropane)	NA	NA	NA	na	na	0.58 U	na	na	0.58 U	na	0.58 U	na	0.58 U	na	0.58 U
2,4,5-Trichlorophenol	1	23	23	25 U	4 U	1.1 U	29 U	4 U	1.1 U	25 U	1.1 U	26 U	1.1 U	27 U	1.1 U
2,4,6-Trichlorophenol	3.5	6.5	6.5	10 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	11 U	1.1 U
2,4-Dichlorophenol	0.3	13	13	10 U	4 U	0.76 U	**3** J	**3.2** J	**1.3** J	10 U	0.76 U	11 U	0.76 U	11 U	0.76 U
2,4-Dimethylphenol	150	160	160	10 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	11 U	1.1 U
2,4-Dinitrophenol	15	3	3	25 U	25 UJ	10 U	29 U	25 UJ	10 U	25 U	10 U	26 U	10 U	27 UJ	10 U
2,4-Dinitrotoluene	0.06	9.1	9.1	10 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	11 U	1.1 U
2,6-Dinitrotoluene	0.06	0.8	0.8	10 U	10 U	0.87 U	12 U	10 U	0.87 U	10 U	0.87 U	11 U	0.87 U	11 U	0.87 U
2-Chloronaphthalene	610	1700	1700	10 U	10 U	1 U	12 U	10 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
2-Chlorophenol	38	130	130	10 U	10 U	0.79 U	6 J	6.5 J	2.9 J	10 U	0.79 U	11 U	0.79 U	11 U	0.79 U
2-Methyl-4,6-Dinitrophenol	NA	NA	NA	25 U	25 U	10 U	29 U	25 U	10 U	25 U	10 U	26 U	10 U	27 U	10 U
2-Methylnaphthalene	15	30	30	10 U	10 U	0.14	12 U	10 U	0.022 U	10 U	0.022 U	11 U	0.022 U	11 U	0.022 U
2-Methylphenol (o-Cresol)	38	250	250	10 U	10 U	0.59 U	12 U	10 U	0.59 U	10 U	0.59 U	11 U	0.59 U	11 U	0.59 U
2-Nitroaniline	23	NA	NA	25 U	7.5 U	0.72 U	29 U	7.5 U	0.72 U	25 U	0.72 U	26 U	0.72 U	27 U	0.72 U
2-Nitrophenol	NA	NA	NA	10 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	11 U	1.1 U
3,3'-Dichlorobenzidine	0.08	0.03	0.03	10 U	14 U	1 U	12 U	14 U	1 U	10 U	1 U	11 UJ	1 U	11 U	1 U
3-Methylphenol/4-Methylphenol	3.8	70	70	na	10 U	1 U	na	10 U	1 U	na	1 U	na	1 U	na	1 U
3-Nitroaniline	1.8	NA	NA	25 U	25 U	0.64 U	29 U	25 U	0.64 U	25 UJ	0.64 U	26 U	0.64 U	27 U	0.64 U
4-Bromophenyl-phenylether	NA	NA	NA	10 U	10 U	1 U	12 U	10 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
4-Chloro-3-methylphenol	68	100	100	10 U	10 U	1 U	12 U	10 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
4-Chloroaniline	30	2.5	2.5	10 U	10 U	1 U	12 U	10 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
4-Chlorophenylphenyl ether	NA	NA	NA	10 U	10 U	0.7 U	12 U	10 U	0.7 U	10 U	0.7 U	11 U	0.7 U	11 U	0.7 U
4-Methylphenol (p-Cresol)	3.8	70	70	10 U	na	na	12 U	na	na	10 U	na	11 U	na	11 U	na
4-Nitroaniline	1.8	1200	1200	25 U	25 U	0.86 U	29 U	25 U	0.86 U	25 UJ	0.86 U	26 UJ	0.86 U	27 U	0.86 U
4-Nitrophenol	61	55	55	25 U	15 UJ	5 U	29 UJ	15 UJ	5 U	25 U	5 U	26 U	5 U	27 UJ	5 U
Acenaphthene	20	3	3	10 U	10 U	0.036	12 U	10 U	0.025 U	10 U	0.025 U	11 U	0.025 U	11 U	0.025 U
Acenaphthylene	230	**	**	10 U	10 U	0.15	12 U	10 U	0.024 U	10 U	0.024 U	11 U	0.024 U	11 U	0.024 U
Anthracene	2300	0.3	0.3	10 U	10 U	0.031 U	12 U	10 U	0.031 U	10 U	0.031 U	11 U	0.031 U	11 U	0.031 U
Benzo(a)anthracene	0.05	**	**	10 U	4 U	0.07 U	12 U	4 U	0.07 U	10 U	0.07 U	11 U	0.07 U	11 U	0.07 U
Benzo(a)pyrene	0.2	**	**	10 U	0.59 U	0.06 U	12 U	0.59 U	0.06 U	10 U	0.06 U	11 U	0.06 U	11 U	0.06 U
Benzo(b)fluoranthene	0.05	**	**	10 U	4 U	0.074 U	12 U	4 U	0.074 U	10 U	0.074 U	11 U	0.074 U	11 U	0.074 U
Benzo(g,h,i)perylene	230	**	**	10 U	10 UJ	0.096 U	12 U	10 UJ	0.096 U	10 U	0.096 U	11 U	0.096 U	11 U	0.096 U
Benzo(k)fluoranthene	0.5	**	**	10 U	4 U	0.058 U	12 U	4 U	0.058 U	10 U	0.058 U	11 U	0.058 U	11 U	0.058 U
bis(2-Chloroethoxy)methane	NA	NA	NA	10 U	10 U	1 U	12 U	10 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
bis(2-Chloroethyl)ether	0.03	0.6	0.6	10 U	1.5 U	1 U	12 U	1.5 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
Bis(2-Chloroisopropyl)Ether	0.5	25	25	10 U	7.5 U	na	12 UJ	7.5 U	na	10 U	na	11 U	na	11 UJ	na
bis(2-Ethylhexyl)phthalate (BEHP)	6	2.4	2.4	10 U	**9.3** J	2.4 U	12 U	10 UJ	2.4 U	10 U	2.4 U	11 U	2.4 U	11 U	2.4 U
Butylbenzylphthalate	150	26	26	10 U	1 J	0.74 U	12 U	10 UJ	0.74 U	10 U	0.74 U	11 U	0.74 U	11 U	0.74 U
Carbazole	1.9	47	47	10 U	7.5 U	0.54 U	12 U	7.5 U	0.54 U	10 UJ	0.54 U	11 U	0.54 U	11 U	0.54 U
Chrysene	5.2	**	**	10 U	5 U	0.088 U	12 U	5 U	0.088 U	10 U	0.088 U	11 U	0.088 U	11 U	0.088 U
Dibenz(a,h)anthracene	0.005	**	**	10 U	7.5 U	0.065 U	12 U	7.5 U	0.065 U	10 U	0.065 U	11 U	0.065 U	11 U	0.065 U
Dibenzofuran	30	67	67	10 U	10 U	1 U	12 U	10 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
Diethylphthalate	6100	380	380	10 U	10 U	1 U	12 U	10 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
Dimethylphthalate	76000	1400	1400	10 U	10 U	0.57 U	12 U	10 U	0.57 U	10 U	0.57 U	11 U	0.57 U	11 U	0.57 U
Di-n-butylphthalate	NA	NA	NA	10 U	10 UJ	1 U	12 U	10 UJ	1 U	10 U	1 U	11 U	1 U	11 U	1 U
Di-n-octylphthalate	150	NA	NA	10 U	10 UJ	1.2 U	12 U	10 UJ	1.2 U	10 U	1.2 U	11 U	1.2 U	11 U	1.2 U
Diphenylamine	190	NA	NA	na	7 U	na	na	7 U	na	na	na	na	na	na	na
Fluoranthene	300	0.3	0.3	10 U	10 U	0.061 U	12 U	10 U	0.061 U	10 U	0.061 U	11 U	0.061 U	11 U	0.061 U
Fluorene	300	30	30	10 U	10 U	0.026 U	12 U	10 U	0.026 U	10 U	0.026 U	11 U	0.026 U	11 U	0.026 U
Hexachlorobenzene	1	0.0003	0.0003	10 U	1 U	0.61 U	12 U	1 U	0.61 U	10 U	0.61 U	11 U	0.61 U	11 U	0.61 U
Hexachlorobutadiene	0.5	49.7	49.7	10 U	10 U	0.5 U	12 U	10 U	0.5 U	10 UJ	0.5 U	11 U	0.5 U	11 U	0.5 U
Hexachlorocyclopentadiene	50	3	3	10 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	11 UJ	1.1 U
Hexachloroethane	2.7	3.6	3.6	10 U	10 U	0.7 U	12 U	10 U	0.7 U	10 U	0.7 U	11 U	0.7 U	11 U	0.7 U
Indeno(1,2,3-cd)pyrene	0.05	**	**	10 U	7.5 U	0.08 U	12 U	7.5 U	0.08 U	10 UJ	0.08 U	11 U	0.08 U	11 U	0.08 U
Isophorone	40	650	650	10 U	10 U	1 U	12 U	10 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
Naphthalene	15	26	26	8 J	6.8 U	2	12 U	3.5 J	1.5	10 U	0.028 U	2 J	0.028 U	11 U	0.028 U

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	27GS20			30GI111			30GI126		30GI164		30GMW03	
				1993	1995	2003	1993	1995	2003	1993	2003	1993	2003	1993	2003
Nitrobenzene	3.8	90	90	10 U	9.5 U	1 U	12 U	9.5 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
N-Nitroso-di-n-propylamine	0.005	0.5	0.5	10 U	4 U	1 U	12 U	4 U	1 U	10 U	1 U	11 U	1 U	11 U	1 U
N-Nitrosodiphenylamine	7.8	6.5	6.5	10 U	na	1 U	12 U	na	1 U	10 U	1 U	11 U	1 U	11 U	1 U
Pentachlorophenol	1	8.2	8.2	25 U	1 U	2 U	29 U	1 U	2 U	25 U	2 U	26 U	2 U	27 U	2 U
Phenanthrene	230	**	**	10 U	10 U	0.025 U	12 U	10 U	0.025 U	10 U	0.025 U	11 U	0.025 U	11 U	0.025 U
Phenol	10	6.5	6.5	10 U	10 U	1 U	12 U	6.9 J	1 U	3 J	1 U	11 U	1 U	**24**	1 U
Pyrene	230	0.3	0.3	10 U	10 U	0.042 U	12 U	10 U	0.042 U	10 U	0.042 U	11 U	0.042 U	11 U	0.042 U

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	30GS06 1993	30GS06 1995	30GS06 2003	30GS11 1993	30GS11 2003	30GS18 1993	30GS18 2003	30GS22 1993	30GS22 1995	30GS22 2003	30GS46 1993	30GS46 1995	30GS46 2003
1,2,4-Trichlorobenzene	70	23	23	11 U	10 U	0.51 U	10 U	0.51 U	10 U	0.51 U	12 U	10 U	0.51 U	2 J	5.6 J	2 J
1,2-Dichlorobenzene	600	99	99	3 J	10 U	19	10 U	1 U	10 U	1.1 J	12 U	10 U	1 U	10 U	1.6 J	1 U
1,3-Dichlorobenzene	230	85	85	1 J	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	4.3 J	1 U
1,4-Dichlorobenzene	75	3.3	3.3	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	2 J	6.3 J	1 U
1-Methyl naphthalene	15	95	95	na	na	**25** D	na	0.096	na	0.028 U	na	na	**17**	na	na	0.4
2,2'-oxybis(1-Chloropropane)	NA	NA	NA	na	na	0.58 U	na	0.58 U	na	0.58 U	na	na	0.58 U	na	na	0.58 U
2,4,5-Trichlorophenol	1	23	23	28 U	4 U	1.1 U	26 U	1.1 U	25 U	1.1 U	30 U	4 U	1.1 U	26 UJ	4 U	1.1 U
2,4,6-Trichlorophenol	3.5	6.5	6.5	11 U	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	10 U	1.1 U
2,4-Dichlorophenol	0.3	13	13	11 U	4 U	0.76 U	10 U	0.76 U	10 U	0.76 U	12 U	4 U	0.76 U	10 U	4 U	0.76 U
2,4-Dimethylphenol	150	160	160	3 J	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	10 U	1.1 U
2,4-Dinitrophenol	15	3	3	28 U	25 UJ	10 U	26 UJ	10 U	25 UJ	10 U	30 UJ	25 UJ	10 U	26 U	25 UJ	10 U
2,4-Dinitrotoluene	0.06	9.1	9.1	11 U	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	10 U	1.1 U
2,6-Dinitrotoluene	0.06	0.8	0.8	11 U	10 U	0.87 U	10 U	0.87 U	10 U	0.87 U	12 U	10 U	0.87 U	10 U	10 U	0.87 U
2-Chloronaphthalene	610	1700	1700	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	10 U	1 U
2-Chlorophenol	38	130	130	11 U	10 U	0.79 U	10 U	0.79 U	10 U	0.79 U	12 U	10 U	0.79 U	10 U	10 U	0.79 U
2-Methyl-4,6-Dinitrophenol	NA	NA	NA	28 U	25 U	10 U	26 U	10 U	25 U	10 U	30 U	25 U	10 U	26 U	25 U	10 U
2-Methylnaphthalene	15	30	30	**35**	10 U	**32** D	10 U	0.14	10 U	0.022 U	12	1.3 J	**19**	2 J	6.7 J	0.51
2-Methylphenol (o-Cresol)	38	250	250	11 U	10 U	0.59 U	10 U	0.59 U	10 U	0.59 U	12 U	10 U	0.59 U	10 U	10 U	0.59 U
2-Nitroaniline	23	NA	NA	28 U	7.5 U	0.72 U	26 UJ	0.72 U	25 U	0.72 U	30 U	7.5 U	0.72 U	26 U	7.5 U	0.72 U
2-Nitrophenol	NA	NA	NA	11 U	10 U	1.1 U	10 U	1.1 U	10 U	1.1 U	12 U	10 U	1.1 U	10 U	10 U	1.1 U
3,3'-Dichlorobenzidine	0.08	0.03	0.03	11 UJ	14 U	1 U	10 U	1 U	10 UJ	1 U	12 U	14 U	1 U	10 U	14 U	1 U
3-Methylphenol/4-Methylphenol	3.8	70	70	na	10 U	**40**	na	1 U	na	1 U	na	10 U	**63**	na	**9.2** J	1.7 J
3-Nitroaniline	1.8	NA	NA	28 U	25 U	0.64 U	26 U	0.64 U	25 UJ	0.64 U	30 U	25 U	0.64 U	26 U	25 U	0.64 U
4-Bromophenyl-phenylether	NA	NA	NA	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	10 U	1 U
4-Chloro-3-methylphenol	68	100	100	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	10 U	1 U
4-Chloroaniline	30	2.5	2.5	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	10 U	1 U
4-Chlorophenylphenyl ether	NA	NA	NA	11 U	10 U	0.7 U	10 U	0.7 U	10 U	0.7 U	12 U	10 U	0.7 U	10 U	10 U	0.7 U
4-Methylphenol (p-Cresol)	3.8	70	70	**4** J	na	na	10 U	na	10 U	na	12 U	na	na	**21**	na	na
4-Nitroaniline	1.8	1200	1200	28 UJ	25 U	0.86 U	26 U	0.86 U	25 UJ	0.86 U	30 U	25 U	0.86 U	26 U	25 U	0.86 U
4-Nitrophenol	61	55	55	28 U	15 U	5 U	26 U	5 U	25 UJ	5 U	30 UJ	15 UJ	5 U	26 U	15 UJ	5 U
Acenaphthene	20	3	3	1 J	10 U	1.4	10 U	0.025 U	10 U	0.025 U	12 U	10 U	0.025 U	10 U	10 U	0.025 U
Acenaphthylene	230	**	**	11 U	10 U	0.15	10 U	0.024 U	10 U	0.024 U	12 U	10 U	0.024 U	10 U	10 U	0.024 U
Anthracene	2300	0.3	0.3	11 U	10 U	0.71	10 U	0.031 U	10 U	0.031 U	12 U	10 U	0.031 U	10 U	10 U	0.031 U
Benzo(a)anthracene	0.05	**	**	11 U	4 U	0.07 U	10 U	0.07 U	10 U	0.07 U	12 U	4 U	0.07 U	10 U	4 U	0.07 U
Benzo(a)pyrene	0.2	**	**	11 U	0.59 U	0.06 U	10 U	0.06 U	10 U	0.06 U	12 U	0.59 U	0.06 U	10 U	0.59 U	0.06 U
Benzo(b)fluoranthene	0.05	**	**	11 U	4 U	0.074 U	10 U	0.074 U	10 U	0.074 U	12 U	4 U	0.074 U	10 U	4 U	0.074 U
Benzo(g,h,i)perylene	230	**	**	11 U	10 U	0.096 U	10 UJ	0.096 U	10 U	0.096 U	12 U	10 UJ	0.096 U	10 U	10 UJ	0.096 U
Benzo(k)fluoranthene	0.5	**	**	11 U	4 U	0.058 U	10 U	0.058 U	10 U	0.058 U	12 U	4 U	0.058 U	10 U	4 U	0.058 U
bis(2-Chloroethoxy)methane	NA	NA	NA	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	10 U	1 U
bis(2-Chloroethyl)ether	0.03	0.6	0.6	11 U	1.5 U	1 U	10 U	1 U	10 U	1 U	12 U	1.5 U	1 U	10 U	1.5 U	1 U
Bis(2-Chloroisopropyl)Ether	0.5	25	25	11 U	7.5 U	na	10 U	na	10 U	na	12 UJ	7.5 U	na	10 U	7.5 U	na
bis(2-Ethylhexyl)phthalate (BEHP)	6	2.4	2.4	11 U	10 U	2.4 U	10 U	2.4 U	10 U	2.4 U	12 U	**11**	2.4 U	10 U	**9** J	2.4 U
Butylbenzylphthalate	150	26	26	11 U	10 U	0.74 U	10 U	0.74 U	10 U	0.74 U	12 U	1.2 J	0.74 U	10 U	1.2 J	0.74 U
Carbazole	1.9	47	47	**14** J	7.5 U	**13**	10 U	0.54 U	10 UJ	0.54 U	12 U	7.5 U	0.54 U	10 UJ	7.5 U	0.54 U
Chrysene	5.2	**	**	11 U	5 U	0.088 U	10 U	0.088 U	10 U	0.088 U	12 U	5 U	0.088 U	10 U	5 U	0.088 U
Dibenz(a,h)anthracene	0.005	**	**	11 U	7.5 U	0.065 U	10 UJ	0.065 U	10 U	0.065 U	12 U	7.5 U	0.065 U	10 U	7.5 U	0.065 U
Dibenzofuran	30	67	67	1 J	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	10 U	1 U
Diethylphthalate	6100	380	380	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	10 U	1 U
Dimethylphthalate	76000	1400	1400	11 U	10 U	0.57 U	10 U	0.57 U	10 U	0.57 U	12 U	10 U	0.57 U	10 U	10 U	0.57 U
Di-n-butylphthalate	NA	NA	NA	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	0.45 J	1 U	10 U	0.48 J	1 U
Di-n-octylphthalate	150	NA	NA	11 U	10 U	1.2 U	10 U	1.2 U	10 U	1.2 U	12 U	10 UJ	1.2 U	10 U	10 UJ	1.2 U
Diphenylamine	190	NA	NA	na	7 U	na	na	na	na	na	na	7 U	na	na	7 U	na
Fluoranthene	300	0.3	0.3	11 U	10 U	0.78	10 U	0.061 U	10 U	0.061 U	12 U	10 U	0.061 U	10 U	10 U	0.061 U
Fluorene	300	30	30	1 J	10 U	0.92	10 U	0.026 U	10 U	0.026 U	12 U	10 U	0.31	10 U	10 U	0.026 U
Hexachlorobenzene	1	0.0003	0.0003	11 U	1 U	0.61 U	10 U	0.61 U	10 U	0.61 U	12 U	1 U	0.61 U	10 U	1 U	0.61 U
Hexachlorobutadiene	0.5	49.7	49.7	11 U	10 U	0.5 U	10 UJ	0.5 U	10 U	0.5 U	12 U	10 U	0.5 U	10 U	10 U	0.5 U
Hexachlorocyclopentadiene	50	3	3	11 UJ	10 U	1.1 U	10 UJ	1.1 U	10 UJ	1.1 U	12 UJ	10 U	1.1 U	10 U	10 U	1.1 U
Hexachloroethane	2.7	3.6	3.6	11 U	10 U	0.7 U	10 U	0.7 U	10 U	0.7 U	12 U	10 U	0.7 U	10 U	10 U	0.7 U
Indeno(1,2,3-cd)pyrene	0.05	**	**	11 U	7.5 U	0.08 U	10 U	0.08 U	10 U	0.08 U	12 U	7.5 U	0.08 U	10 U	7.5 U	0.08 U
Isophorone	40	650	650	11 U	10 U	1 U	10 U	1 U	10 U	1 U	12 U	10 U	1 U	10 U	10 U	1 U
Naphthalene	15	26	26	**76**	0.91 J	**90** D	2 J	1.5	10 U	0.028 U	**23**	14	12	7 J	5.6 J	1.2

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	30GS06			30GS11		30GS18		30GS22			30GS46		
				1993	1995	2003	1993	2003	1993	2003	1993	1995	2003	1993	1995	2003
Nitrobenzene	3.8	90	90	11 U	9.5 U	1 U	10 U	1 U	10 U	1 U	12 U	9.5 U	1 U	10 U	9.5 U	1 U
N-Nitroso-di-n-propylamine	0.005	0.5	0.5	11 U	4 U	1 U	10 U	1 U	10 U	1 U	12 U	4 U	1 U	10 U	4 U	1 U
N-Nitrosodiphenylamine	7.8	6.5	6.5	11 U	na	1 U	10 U	1 U	10 UJ	1 U	12 U	na	1 U	10 U	na	1 U
Pentachlorophenol	1	8.2	8.2	28 U	1 U	**2.2** J	26 U	2 U	25 U	2 U	30 U	1 U	2 U	26 UJ	1 U	2 U
Phenanthrene	230	**	**	3 J	10 U	3.8	10 U	0.025 U	10 U	0.025 U	12 U	10 U	0.025 U	10 U	10 U	0.025 U
Phenol	10	6.5	6.5	7 J	10 U	1 U	**10** J	1 U	14 U	1 U	12 U	10 U	1 U	17 U	10 U	1 U
Pyrene	230	0.3	0.3	11 U	10 U	0.66	10 U	0.056	10 U	0.042 U	12 U	10 U	0.042 U	10 U	10 U	0.042 U

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	30GS51			30GS103		30GS105		30GS111			30GS123	
				1993	1995	2003	1993	2003	1993	2003	1993	1995	2003	1993	2003
1,2,4-Trichlorobenzene	70	23	23	1 J	10 U	0.51 U	10 U	0.51 U	11 U	0.51 U	10 U	10 U	0.51 U	10 U	0.51 U
1,2-Dichlorobenzene	600	99	99	10 U	10 U	1 U	10 U	1 U	11 U	1 U	3 J	10 U	1 U	10 U	1 U
1,3-Dichlorobenzene	230	85	85	10 U	10 U	1 U	10 U	1 U	11 U	1 U	6 J	1.5 J	5.4 J	10 U	1 U
1,4-Dichlorobenzene	75	3.3	3.3	10 U	10 U	1 U	10 U	1 U	11 U	1 U	41	2.3 J	7.2 J	10 U	1 U
1-Methyl naphthalene	15	95	95	na	na	0.072	na	0.028 U	na	0.028 U	na	na	0.043 J	na	0.028 U
2,2'-oxybis(1-Chloropropane)	NA	NA	NA	na	na	0.58 U	na	0.58 U	na	0.58 U	na	na	0.58 U	na	0.58 U
2,4,5-Trichlorophenol	1	23	23	25 U	4 U	1.1 U	24 U	1.1 U	28 U	1.1 U	24 U	4 U	1.1 U	24 U	1.1 U
2,4,6-Trichlorophenol	3.5	6.5	6.5	10 U	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	10 U	10 U	1.1 U	10 U	1.1 U
2,4-Dichlorophenol	0.3	13	13	10 U	4 U	0.76 U	10 U	0.76 U	11 U	0.76 U	10 U	4 U	0.76 U	10 U	0.76 U
2,4-Dimethylphenol	150	160	160	1 J	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	10 U	10 U	2.5 J	10 U	1.1 U
2,4-Dinitrophenol	15	3	3	25 UJ	25 UJ	10 U	24 UJ	10 U	28 U	10 U	24 UJ	25 UJ	10 U	24 UJ	10 U
2,4-Dinitrotoluene	0.06	9.1	9.1	10 U	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	10 U	10 U	1.1 U	10 U	1.1 U
2,6-Dinitrotoluene	0.06	0.8	0.8	10 U	10 U	0.87 U	10 U	0.87 U	11 U	0.87 U	10 U	10 U	0.87 U	10 U	0.87 U
2-Chloronaphthalene	610	1700	1700	10 U	10 U	1 U	10 U	1 U	11 U	1 U	10 U	10 U	1 U	10 U	1 U
2-Chlorophenol	38	130	130	10 U	10 U	0.79 U	10 U	0.79 U	11 U	0.79 U	2 J	10 U	1.4 J	10 U	0.79 U
2-Methyl-4,6-Dinitrophenol	NA	NA	NA	25 U	25 U	10 U	24 U	10 U	28 U	10 U	24 U	25 U	10 U	24 U	10 U
2-Methylnaphthalene	15	30	30	1 J	1.1 J	0.022 U	10 U	0.022 U	11 U	0.022 U	10 U	10 U	0.025 J	10 U	0.022 U
2-Methylphenol (o-Cresol)	38	250	250	10 U	10 U	0.59 U	10 U	0.59 U	11 U	0.59 U	10 U	10 U	0.59 U	10 U	0.59 U
2-Nitroaniline	23	NA	NA	25 U	0.13 J	0.72 U	24 U	0.72 U	28 U	0.72 U	24 U	7.5 U	0.72 U	24 U	0.72 U
2-Nitrophenol	NA	NA	NA	10 U	10 U	1.1 U	10 U	1.1 U	11 U	1.1 U	10 U	10 U	1.1 U	10 U	1.1 U
3,3'-Dichlorobenzidine	0.08	0.03	0.03	10 UJ	14 U	1 U	10 U	1 U	11 U	1 U	10 U	14 U	1 U	10 U	1 U
3-Methylphenol/4-Methylphenol	3.8	70	70	na	2.8 J	1 U	na	1 U	na	1 U	na	10 U	1 U	na	1 U
3-Nitroaniline	1.8	NA	NA	25 UJ	25 U	0.64 U	24 U	0.64 U	28 U	0.64 U	24 U	25 U	0.64 U	24 U	0.64 U
4-Bromophenyl-phenylether	NA	NA	NA	10 U	10 U	1 U	10 U	1 U	11 U	1 U	10 U	10 U	1 U	10 U	1 U
4-Chloro-3-methylphenol	68	100	100	10 U	10 U	1 U	10 U	1 U	11 U	1 U	10 U	10 U	1 U	10 U	1 U
4-Chloroaniline	30	2.5	2.5	10 U	10 U	1 U	10 U	1 U	11 U	1 U	10 U	10 U	1 U	10 U	1 U
4-Chlorophenylphenyl ether	NA	NA	NA	10 U	10 U	0.7 U	10 U	0.7 U	11 U	0.7 U	10 U	10 U	0.7 U	10 U	0.7 U
4-Methylphenol (p-Cresol)	3.8	70	70	**15**	na	na	10 U	na	11 U	na	10 U	na	na	10 U	na
4-Nitroaniline	1.8	1200	1200	25 UJ	25 U	0.86 U	24 UJ	0.86 U	28 U	0.86 U	24 UJ	25 U	0.86 U	24 UJ	0.86 U
4-Nitrophenol	61	55	55	25 UJ	15 UJ	5 U	24 U	5 U	28 UJ	5 U	24 U	15 UJ	5 U	24 U	5 U
Acenaphthene	20	3	3	10 U	10 U	0.025 U	10 U	0.05	11 U	0.025 U	10 U	10 U	0.032	10 U	0.025 U
Acenaphthylene	230	**	**	10 U	10 U	0.024 U	10 U	0.024 U	11 U	0.024 U	10 U	10 U	0.024 U	10 U	0.024 U
Anthracene	2300	0.3	0.3	10 U	10 U	0.031 U	10 U	0.031 U	11 U	0.031 U	10 U	10 U	0.031 U	10 U	0.031 U
Benzo(a)anthracene	0.05	**	**	10 U	4 U	0.07 U	10 U	0.07 U	11 U	0.07 U	10 U	4 U	0.07 U	10 U	0.07 U
Benzo(a)pyrene	0.2	**	**	10 U	0.59 U	0.06 U	10 U	0.06 U	11 U	0.06 U	10 U	0.59 U	0.06 U	10 U	0.06 U
Benzo(b)fluoranthene	0.05	**	**	10 U	4 U	0.074 U	10 U	0.074 U	11 U	0.074 U	10 U	4 U	0.074 U	10 U	0.074 U
Benzo(g,h,i)perylene	230	**	**	10 U	10 UJ	0.096 U	10 U	0.096 U	11 U	0.096 U	10 U	10 UJ	0.096 U	10 U	0.096 U
Benzo(k)fluoranthene	0.5	**	**	10 U	4 U	0.058 U	10 U	0.058 U	11 U	0.058 U	10 U	4 U	0.058 U	10 U	0.058 U
bis(2-Chloroethoxy)methane	NA	NA	NA	10 U	10 U	1 U	10 U	1 U	11 U	1 U	10 U	10 U	1 U	10 U	1 U
bis(2-Chloroethyl)ether	0.03	0.6	0.6	10 U	1.5 U	1 U	10 U	1 U	11 U	1 U	10 U	1.5 U	1 U	10 U	1 U
Bis(2-Chloroisopropyl)Ether	0.5	25	25	10 U	7.5 U	na	10 U	na	11 UJ	na	10 U	7.5 U	na	10 U	na
bis(2-Ethylhexyl)phthalate (BEHP)	6	2.4	2.4	10 U	**13** J	2.4 U	10 U	2.4 U	11 U	2.4 U	10 U	10 UJ	2.4 U	10 U	2.4 U
Butylbenzylphthalate	150	26	26	10 U	1.2 J	0.74 U	10 U	0.74 U	11 U	0.74 U	10 U	10 UJ	0.74 U	10 U	0.74 U
Carbazole	1.9	47	47	10 UJ	7.5 U	0.54 U	10 U	0.54 U	11 U	0.54 U	10 U	7.5 U	0.54 U	10 U	0.54 U
Chrysene	5.2	**	**	10 U	5 U	0.088 U	10 U	0.088 U	11 U	0.088 U	10 U	5 U	0.088 U	10 U	0.088 U
Dibenz(a,h)anthracene	0.005	**	**	10 U	7.5 U	0.065 U	10 U	0.065 U	11 U	0.065 U	10 U	7.5 U	0.065 U	10 U	0.065 U
Dibenzofuran	30	67	67	10 U	10 U	1 U	10 U	1 U	11 U	1 U	10 U	10 U	1 U	10 U	1 U
Diethylphthalate	6100	380	380	10 U	10 U	1 U	10 U	1 U	11 U	1 U	10 U	10 U	1 U	10 U	1 U
Dimethylphthalate	76000	1400	1400	10 U	10 U	0.57 U	10 U	0.57 U	11 U	0.57 U	10 U	10 U	0.57 U	10 U	0.57 U
Di-n-butylphthalate	NA	NA	NA	10 U	10 UJ	1 U	10 U	1 U	11 U	1 U	10 U	10 UJ	1 U	10 U	1 U
Di-n-octylphthalate	150	NA	NA	10 U	10 UJ	1.2 U	10 U	1.2 U	11 U	1.2 U	10 U	10 UJ	1.2 U	10 U	1.2 U
Diphenylamine	190	NA	NA	na	7 U	na	na	na	na	na	na	7 U	na	na	na
Fluoranthene	300	0.3	0.3	10 U	10 U	0.061 U	10 U	0.061 U	11 U	0.061 U	10 U	10 U	0.061 U	10 U	0.061 U
Fluorene	300	30	30	10 U	10 U	0.026 U	10 U	0.026 U	11 U	0.026 U	10 U	10 U	0.026 U	10 U	0.026 U
Hexachlorobenzene	1	0.0003	0.0003	10 U	1 U	0.61 U	10 U	0.61 U	11 U	0.61 U	10 U	1 U	0.61 U	10 U	0.61 U
Hexachlorobutadiene	0.5	49.7	49.7	10 U	10 U	0.5 U	10 U	0.5 U	11 U	0.5 U	10 U	10 U	0.5 U	10 U	0.5 U
Hexachlorocyclopentadiene	50	3	3	10 UJ	10 U	1.1 U	10 UJ	1.1 U	11 U	1.1 U	10 UJ	10 U	1.1 U	10 UJ	1.1 U
Hexachloroethane	2.7	3.6	3.6	10 U	10 U	0.7 U	10 U	0.7 U	11 U	0.7 U	10 U	10 U	0.7 U	10 U	0.7 U
Indeno(1,2,3-cd)pyrene	0.05	**	**	10 U	7.5 U	0.08 U	10 U	0.08 U	11 U	0.08 U	10 U	7.5 U	0.08 U	10 U	0.08 U
Isophorone	40	650	650	10 U	10 U	1 U	10 U	1 U	11 U	1 U	10 U	10 U	1 U	10 U	1 U
Naphthalene	15	26	26	5 J	**15**	0.092	10 U	0.028 U	11 U	0.028 U	10 U	6.8 U	**17**	10 U	0.028 U

Table B-9: Summary of Groundwater SVOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface Water CTL	Marine Surface Water CTL	30GS51			30GS103		30GS105		30GS111			30GS123	
				1993	1995	2003	1993	2003	1993	2003	1993	1995	2003	1993	2003
Nitrobenzene	3.8	90	90	10 U	9.5 U	1 U	10 U	1 U	11 U	1 U	10 U	9.5 U	1 U	10 U	1 U
N-Nitroso-di-n-propylamine	0.005	0.5	0.5	10 U	4 U	1 U	10 U	1 U	11 U	1 U	10 U	4 U	1 U	10 U	1 U
N-Nitrosodiphenylamine	7.8	6.5	6.5	10 UJ	na	1 U	10 U	1 U	11 U	1 U	10 U	na	1 U	10 U	1 U
Pentachlorophenol	1	8.2	8.2	25 U	1 U	2 U	24 U	2 U	28 U	2 U	24 U	1 U	2 U	24 U	2 U
Phenanthrene	230	**	**	10 U	10 U	0.025 U	10 U	0.025 U	11 U	0.025 U	10 U	10 U	0.025 U	10 U	0.025 U
Phenol	10	6.5	6.5	13 U	10 U	1 U	7 J	1 U	6 J	1 U	4 J	10 U	1 U	5 J	1 U
Pyrene	230	0.3	0.3	10 U	10 U	0.058	10 U	0.042 U	11 U	0.043 U	10 U	10 U	0.042 U	10 U	0.042 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SI00602	011SI01501	011SRA0101	011SRA0201	011SRA0301	011SRA0401	011SRA0501	011SRA0501	011SRA0601
1,1,1-Trichloroethane	3300	400	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 UJ	0.01 UJ	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
1,1-Dichloroethane	2000	290	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
2-Butanone (MEK)	21000	3100	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
2-Hexanone	34	5.1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Acetone	5500	780	0.059 J	0.01 U	0.015 U	0.049 U	0.013 U	0.01 U	0.012 U	0.01 UJ	0.011 UJ
Benzene	1.6	1.1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Bromodichloromethane	2	1.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Bromoform	84	48	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Bromomethane	15	2.2	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Carbon disulfide	1400	200	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 UJ	0.01 UJ	0.011 U
Chlorobenzene	200	30	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Chloroethane	na	2.9	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Chloroform	0.5	0.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Chloromethane	2.3	1.7	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Dibromochloromethane	2.1	1.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Ethylbenzene	8400	1100	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Methylene chloride	23	16	0.017 U	0.014 U	0.012 U	0.01 U	0.01 U	0.01 U	0.015 U	0.01 U	0.011 U
Styrene	21000	2700	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Tetrachloroethene	17	8.9	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Toluene	2600	380	0.01 U	0.006 J	0.009 J	0.01 U	0.005 J	0.002 J	0.008 J	0.01 U	0.19
trans-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Trichloroethene	8.5	6	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Vinyl chloride	0.04	0.03	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U
Xylene (Total)	40000	5900	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.011 U

Notes:
All concentrations expressed in milligrams per kilogram
1,2-Dichloroethene (total) compared with cis-1,2-Dichloroethene CTL, which is most stringent isomer CTL
* Indicates the value exceeds the C/I direct exposure SCTL.
Bolding indicates the value exceeds the residential direct exposure SCTL.
Blank cells indicate that the sample was not collected or analyzed for that parameter
na - not analyzed
U - not detected
J - present below the method detection limit but above the instrument detection limit

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SRA0701	011SRA0801	011SRA0901	011SRA1001	011SRA1101	011SRA1201	011SRA1301	011SS00101	011SS00301
1,1,1-Trichloroethane	3300	400	0.011 U	0.011 U	0.011 U	0.01 U	0.01 UJ	1.3 U	0.011 UJ	0.01 U	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.011 UJ	0.011 UJ	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 UJ	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
1,1-Dichloroethane	2000	290	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 UJ	0.011 U	0.01 U	0.011 U
1,2-Dichloroethene (total)	130	19	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 UJ	0.011 U	0.01 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
2-Butanone (MEK)	21000	3100	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 UJ	0.011 U	0.01 U	0.011 U
2-Hexanone	34	5.1	0.011 UJ	0.011 UJ	0.011 U	0.01 U	0.01 U	1.3 UJ	0.011 U	0.01 UJ	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.011 UJ	0.011 UJ	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 UJ	0.011 U
Acetone	5500	780	0.011 U	0.018 U	0.015	0.06 U	0.041 UJ	1.3 UJ	0.011 U	0.01 U	0.011 U
Benzene	1.6	1.1	0.001 J	0.011 U	0.011 U	0.001 J	0.01 U	1.3 U	0.001 J	0.01 U	0.011 U
Bromodichloromethane	2	1.4	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Bromoform	84	48	0.011 UJ	0.011 UJ	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Bromomethane	15	2.2	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Carbon disulfide	1400	200	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.011 U	0.011 U	0.011 U	0.001 J	0.01 UJ	1.3 U	0.011 UJ	0.01 U	0.011 U
Chlorobenzene	200	30	0.011 UJ	0.011 UJ	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 UJ	0.011 U
Chloroethane	na	2.9	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Chloroform	0.5	0.4	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Chloromethane	2.3	1.7	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	1.3 UJ	0.011 U	0.01 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Dibromochloromethane	2.1	1.4	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Ethylbenzene	8400	1100	0.001 J	0.011 UJ	0.011 U	0.001 J	0.01 U	1.3 U	0.011 U	0.01 UJ	0.011 U
Methylene chloride	23	16	0.011 U	0.017 U	0.011 U	0.01 U	0.01 U	1.3 UJ	0.013 U	0.012 U	0.042 U
Styrene	21000	2700	0.011 UJ	0.011 UJ	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 UJ	0.011 U
Tetrachloroethene	17	8.9	0.011 UJ	0.011 UJ	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 UJ	0.011 U
Toluene	2600	380	0.058 J	0.036 J	0.004 J	0.025	0.011 U	1.3 U	0.036	0.026 UJ	0.024 U
trans-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Trichloroethene	8.5	6	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Vinyl chloride	0.04	0.03	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	1.3 U	0.011 U	0.01 U	0.011 U
Xylene (Total)	40000	5900	0.011 UJ	0.011 UJ	0.011 U	0.002 J	0.01 U	0.16 J	0.001 J	0.002 J	0.001 J

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	011SS01101	011SS01301	012S000201	012S000301	012S000401	012S000501	012S000601	012S000701	012S000801
1,1,1-Trichloroethane	3300	400	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
1,1-Dichloroethane	2000	290	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
2-Butanone (MEK)	21000	3100	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 UJ	0.01 U
2-Hexanone	34	5.1	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Acetone	5500	780	0.032 U	1.4 U	0.06 UJ	0.015 UJ	0.011 UJ	0.032 UJ	0.029 U	0.18 UJ	0.022 UJ
Benzene	1.6	1.1	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Bromodichloromethane	2	1.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Bromoform	84	48	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Bromomethane	15	2.2	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Carbon disulfide	1400	200	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Chlorobenzene	200	30	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Chloroethane	na	2.9	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Chloroform	0.5	0.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Chloromethane	2.3	1.7	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 UJ
cis-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Dibromochloromethane	2.1	1.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Ethylbenzene	8400	1100	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Methylene chloride	23	16	0.019 U	0.011 U	0.013 UJ	0.01 UJ	0.01 UJ	0.047 UJ	0.038 U	0.024 UJ	0.018 UJ
Styrene	21000	2700	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Tetrachloroethene	17	8.9	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Toluene	2600	380	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
trans-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Trichloroethene	8.5	6	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U
Vinyl chloride	0.04	0.03	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 UJ
Xylene (Total)	40000	5900	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	012S000901	012S001001	012S001101	012S001201	012S001301	012S001401	012S001501	012S001601	025S000100
1,1,1-Trichloroethane	3300	400	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
1,1-Dichloroethane	2000	290	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
2-Butanone (MEK)	21000	3100	0.011 UJ	0.011 U	0.011 UJ	0.011 U	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.01 U
2-Hexanone	34	5.1	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.01 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Acetone	5500	780	0.048 UJ	0.013 U	0.085 UJ	0.018 UJ	0.02 U	0.012 U	0.005 U	0.011 U	0.03 U
Benzene	1.6	1.1	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Bromodichloromethane	2	1.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Bromoform	84	48	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Bromomethane	15	2.2	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Carbon disulfide	1400	200	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Chlorobenzene	200	30	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Chloroethane	na	2.9	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Chloroform	0.5	0.4	0.001 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Chloromethane	2.3	1.7	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 UJ	0.011 UJ	0.011 U	0.01 U
cis-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Dibromochloromethane	2.1	1.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Ethylbenzene	8400	1100	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Methylene chloride	23	16	0.031 U	0.09 U	0.029 U	0.065 U	0.15 U	0.049 U	0.031 U	0.015 U	0.015 U
Styrene	21000	2700	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Tetrachloroethene	17	8.9	0.011 U	0.011 U	0.011 U	0.002 J	0.011 U	0.011 U	0.011 U	0.011 U	0.001 J
Toluene	2600	380	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
trans-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Trichloroethene	8.5	6	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Vinyl chloride	0.04	0.03	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U
Xylene (Total)	40000	5900	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S000101	025S000202	025S000301	025S000302	025S000402	025S000502	025S000702	025S000900	025S000902
1,1,1-Trichloroethane	3300	400	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
1,1-Dichloroethane	2000	290	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
2-Butanone (MEK)	21000	3100	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
2-Hexanone	34	5.1	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Acetone	5500	780	0.064 U	0.061 U	0.052 U	0.05 U	0.022 U	0.02 U	0.035 U	0.043 U	0.021 U
Benzene	1.6	1.1	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Bromodichloromethane	2	1.4	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Bromoform	84	48	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Bromomethane	15	2.2	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Carbon disulfide	1400	200	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Chlorobenzene	200	30	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Chloroethane	na	2.9	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Chloroform	0.5	0.4	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Chloromethane	2.3	1.7	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Dibromochloromethane	2.1	1.4	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Ethylbenzene	8400	1100	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Methylene chloride	23	16	0.022 U	0.094 U	0.042 U	0.058 U	0.026 U	0.025 U	0.017 U	0.031 U	0.024 U
Styrene	21000	2700	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Tetrachloroethene	17	8.9	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Toluene	2600	380	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Trichloroethene	8.5	6	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Vinyl chloride	0.04	0.03	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U
Xylene (Total)	40000	5900	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S001001	025S001002	025S001101	025S001102	025S001202	025S001302	025S001500	025S001600	025S001601
1,1,1-Trichloroethane	3300	400	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
1,1-Dichloroethane	2000	290	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
1,2-Dichloroethene (total)	130	19	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
2-Butanone (MEK)	21000	3100	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
2-Hexanone	34	5.1	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Acetone	5500	780	0.018 U	0.016 U	0.011 U	0.011 U	0.013 U	0.017 U	0.012 U	0.016 U	0.011 U
Benzene	1.6	1.1	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Bromodichloromethane	2	1.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Bromoform	84	48	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Bromomethane	15	2.2	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Carbon disulfide	1400	200	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Chlorobenzene	200	30	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Chloroethane	na	2.9	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Chloroform	0.5	0.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Chloromethane	2.3	1.7	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Dibromochloromethane	2.1	1.4	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Ethylbenzene	8400	1100	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Methylene chloride	23	16	0.017 U	0.013 U	0.019 U	0.02 U	0.019 U	0.02 U	0.015 U	0.028 U	0.042 U
Styrene	21000	2700	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Tetrachloroethene	17	8.9	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Toluene	2600	380	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
trans-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Trichloroethene	8.5	6	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Vinyl chloride	0.04	0.03	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U
Xylene (Total)	40000	5900	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	025S001602	025S001700	025S001701	025S001702	025S001800	025S001900	025S001901	025S001902	026S000101
1,1,1-Trichloroethane	3300	400	0.001 J	0.01 J	0.011 U	0.011 U	0.011 U	0.006 J	0.01 U	0.056	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
1,1-Dichloroethane	2000	290	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
2-Butanone (MEK)	21000	3100	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
2-Hexanone	34	5.1	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Acetone	5500	780	0.02 U	0.012 U	0.011 U	0.022 U	0.011 U	0.021 U	0.012 U	0.011 U	0.11 UJ
Benzene	1.6	1.1	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Bromodichloromethane	2	1.4	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Bromoform	84	48	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Bromomethane	15	2.2	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Carbon disulfide	1400	200	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Chlorobenzene	200	30	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Chloroethane	na	2.9	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Chloroform	0.5	0.4	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Chloromethane	2.3	1.7	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 UJ
cis-1,3-Dichloropropene	na	na	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Dibromochloromethane	2.1	1.4	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Ethylbenzene	8400	1100	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Methylene chloride	23	16	0.053 U	0.043 U	0.022 U	0.05 U	0.017 U	0.037 U	0.016 U	0.041 U	0.036 UJ
Styrene	21000	2700	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Tetrachloroethene	17	8.9	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Toluene	2600	380	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Trichloroethene	8.5	6	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Vinyl chloride	0.04	0.03	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U
Xylene (Total)	40000	5900	0.01 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.011 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	026S000201	026S000301	026S000401	026S000501	026S000601	027S000100	027S000101	027S000201	027S000202
1,1,1-Trichloroethane	3300	400	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,1-Dichloroethane	2000	290	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
2-Butanone (MEK)	21000	3100	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
2-Hexanone	34	5.1	0.01 U	0.01 U	0.011 UJ	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.01 U	0.011 UJ	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Acetone	5500	780	0.12 UJ	0.035 UJ	0.027 U	0.016 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Benzene	1.6	1.1	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Bromodichloromethane	2	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Bromoform	84	48	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Bromomethane	15	2.2	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Carbon disulfide	1400	200	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Chlorobenzene	200	30	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Chloroethane	na	2.9	0.01 U	0.01 U	0.011 UJ	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Chloroform	0.5	0.4	0.01 U	0.01 U	0.011 UJ	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Chloromethane	2.3	1.7	0.01 UJ	0.01 UJ	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Dibromochloromethane	2.1	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Ethylbenzene	8400	1100	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Methylene chloride	23	16	0.014 UJ	0.017 UJ	0.035 UJ	0.013 UJ	0.012 U	0.01 U	0.011 U	0.021 U	0.038 U
Styrene	21000	2700	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Tetrachloroethene	17	8.9	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Toluene	2600	380	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Trichloroethene	8.5	6	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Vinyl chloride	0.04	0.03	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Xylene (Total)	40000	5900	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S000301	027S000302	027S000401	027S000402	027S000501	027S000502	027S000601	027S000602	027S000701
1,1,1-Trichloroethane	3300	400	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
1,1-Dichloroethane	2000	290	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
2-Butanone (MEK)	21000	3100	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
2-Hexanone	34	5.1	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Acetone	5500	780	0.018 U	0.11 U	0.01 U	0.03 U	0.11 U	0.2 U	2.4 U	0.63 U	0.028 U
Benzene	1.6	1.1	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Bromodichloromethane	2	1.4	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Bromoform	84	48	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Bromomethane	15	2.2	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Carbon disulfide	1400	200	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Chlorobenzene	200	30	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Chloroethane	na	2.9	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Chloroform	0.5	0.4	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.023	0.014 U	0.01 U	0.01 U
Chloromethane	2.3	1.7	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	na	na	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Dibromochloromethane	2.1	1.4	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Ethylbenzene	8400	1100	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Methylene chloride	23	16	0.013 U	0.022 U	0.01 U	0.024 U	0.015 U	0.031 U	0.064 U	0.01 U	0.03 U
Styrene	21000	2700	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Tetrachloroethene	17	8.9	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Toluene	2600	380	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	na	na	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Trichloroethene	8.5	6	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Vinyl chloride	0.04	0.03	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U
Xylene (Total)	40000	5900	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.014 U	0.01 U	0.01 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S000702	027S000801 6/9/1993	027S000802	027S000901	027S000902	027S001002	027S001202	027S001302	027S001402
1,1,1-Trichloroethane	3300	400	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
1,1-Dichloroethane	2000	290	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
2-Butanone (MEK)	21000	3100	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
2-Hexanone	34	5.1	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Acetone	5500	780	0.054 U	0.01 U	0.012 U	0.033 U	0.033 U	0.046 U	0.026 U	0.017 U	0.072 U
Benzene	1.6	1.1	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Bromodichloromethane	2	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Bromoform	84	48	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Bromomethane	15	2.2	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Carbon disulfide	1400	200	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Chlorobenzene	200	30	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Chloroethane	na	2.9	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Chloroform	0.5	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Chloromethane	2.3	1.7	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Dibromochloromethane	2.1	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Ethylbenzene	8400	1100	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Methylene chloride	23	16	0.027 U	0.024 U	0.044 U	0.015 U	0.015 U	0.011 U	0.025 U	0.017 U	0.026 U
Styrene	21000	2700	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Tetrachloroethene	17	8.9	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Toluene	2600	380	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Trichloroethene	8.5	6	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Vinyl chloride	0.04	0.03	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U
Xylene (Total)	40000	5900	0.01 U	0.01 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S001501	027S001701	027S001702	027S001900	027S002000	027S002002	027S002102	027S002202	027S002302
1,1,1-Trichloroethane	3300	400	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
1,1-Dichloroethane	2000	290	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
2-Butanone (MEK)	21000	3100	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
2-Hexanone	34	5.1	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.001 J	0.011 U
Acetone	5500	780	0.035 U	0.087 U	0.16 U	0.011 U	0.058 U	0.032 U	0.044 U	0.077 U	0.14 U
Benzene	1.6	1.1	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Bromodichloromethane	2	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Bromoform	84	48	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Bromomethane	15	2.2	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Carbon disulfide	1400	200	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Chlorobenzene	200	30	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Chloroethane	na	2.9	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Chloroform	0.5	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Chloromethane	2.3	1.7	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Dibromochloromethane	2.1	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Ethylbenzene	8400	1100	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Methylene chloride	23	16	0.016 U	0.018 U	0.015 U	0.011 U	0.022 U	0.04 U	0.027 U	0.022 U	0.029 U
Styrene	21000	2700	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Tetrachloroethene	17	8.9	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Toluene	2600	380	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Trichloroethene	8.5	6	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Vinyl chloride	0.04	0.03	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Xylene (Total)	40000	5900	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S002402	027S002600	027S002602	027S002701	027S002702	027S002802	027S002902	027S003002	027S003101
1,1,1-Trichloroethane	3300	400	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
1,1-Dichloroethane	2000	290	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
2-Butanone (MEK)	21000	3100	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
2-Hexanone	34	5.1	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Acetone	5500	780	0.12 U	0.025 U	0.033 U	0.099 U	0.01 U	0.057 U	0.02 U	0.011 U	0.042 U
Benzene	1.6	1.1	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Bromodichloromethane	2	1.4	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Bromoform	84	48	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Bromomethane	15	2.2	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Carbon disulfide	1400	200	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Chlorobenzene	200	30	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Chloroethane	na	2.9	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Chloroform	0.5	0.4	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Chloromethane	2.3	1.7	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Dibromochloromethane	2.1	1.4	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Ethylbenzene	8400	1100	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Methylene chloride	23	16	0.026 U	0.029 U	0.029 U	0.031 U	0.077 U	0.014 U	0.007 U	0.014 U	0.015 U
Styrene	21000	2700	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Tetrachloroethene	17	8.9	0.011 U	0.011 U	0.011 U	0.004 J	0.01 J	0.012 U	0.011 U	0.01 U	0.01 U
Toluene	2600	380	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	na	na	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Trichloroethene	8.5	6	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Vinyl chloride	0.04	0.03	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U
Xylene (Total)	40000	5900	0.011 U	0.001 J	0.011 U	0.01 U	0.01 U	0.012 U	0.011 U	0.01 U	0.01 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S003202	027S003302	027S004000	027S004002	027S004100	027S004102	027S004202	027S004302	027S004402
1,1,1-Trichloroethane	3300	400	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
1,1-Dichloroethane	2000	290	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
2-Butanone (MEK)	21000	3100	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
2-Hexanone	34	5.1	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Acetone	5500	780	0.018 U	0.015 U	0.046 U	0.066 U	0.054 U	0.031 U	0.014 U	0.12 U	0.87 U
Benzene	1.6	1.1	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Bromodichloromethane	2	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Bromoform	84	48	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Bromomethane	15	2.2	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Carbon disulfide	1400	200	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Chlorobenzene	200	30	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Chloroethane	na	2.9	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Chloroform	0.5	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Chloromethane	2.3	1.7	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Dibromochloromethane	2.1	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Ethylbenzene	8400	1100	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Methylene chloride	23	16	0.023 U	0.039 U	0.021 U	0.022 U	0.06 U	0.026 U	0.012 U	0.021 U	0.029 U
Styrene	21000	2700	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Tetrachloroethene	17	8.9	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Toluene	2600	380	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Trichloroethene	8.5	6	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Vinyl chloride	0.04	0.03	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U
Xylene (Total)	40000	5900	0.01 U	0.01 U	0.011 U	0.011 U	0.023 U	0.01 U	0.011 U	0.011 U	0.011 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S004502	027S004602	027S004702	027S004902	027S005002	027S005102	027S005200	027S005201	027S005202
1,1,1-Trichloroethane	3300	400	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
1,1-Dichloroethane	2000	290	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
2-Butanone (MEK)	21000	3100	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
2-Hexanone	34	5.1	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Acetone	5500	780	0.19 U	0.011 U	0.21 U	0.011 U	0.026 U	0.024 U	0.025 U	0.016 U	0.032 U
Benzene	1.6	1.1	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Bromodichloromethane	2	1.4	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Bromoform	84	48	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Bromomethane	15	2.2	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Carbon disulfide	1400	200	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Chlorobenzene	200	30	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Chloroethane	na	2.9	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Chloroform	0.5	0.4	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Chloromethane	2.3	1.7	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Dibromochloromethane	2.1	1.4	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Ethylbenzene	8400	1100	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Methylene chloride	23	16	0.017 U	0.011 U	0.013 U	0.033 U	0.039 U	0.027 U	0.032 U	0.029 U	0.042 U
Styrene	21000	2700	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Tetrachloroethene	17	8.9	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Toluene	2600	380	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Trichloroethene	8.5	6	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Vinyl chloride	0.04	0.03	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U
Xylene (Total)	40000	5900	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.014 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	027S005300	027S005301	027S005302	030S000402	030S000502	030S000602	030S001002	030S001102	030S001202
1,1,1-Trichloroethane	3300	400	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.001 J	0.01 U	0.011 U	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
1,1-Dichloroethane	2000	290	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
1,2-Dichloroethene (total)	130	19	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
2-Butanone (MEK)	21000	3100	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
2-Hexanone	34	5.1	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Acetone	5500	780	0.018 U	0.012 U	0.014 U	0.12 U	1.3 DU	0.1	0.03 U	0.038 U	0.011 U
Benzene	1.6	1.1	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Bromodichloromethane	2	1.4	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Bromoform	84	48	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Bromomethane	15	2.2	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	
Carbon disulfide	1400	200	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Chlorobenzene	200	30	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Chloroethane	na	2.9	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Chloroform	0.5	0.4	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Chloromethane	2.3	1.7	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Dibromochloromethane	2.1	1.4	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Ethylbenzene	8400	1100	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Methylene chloride	23	16	0.078 U	0.01 U	0.026 U	0.027 U	0.01 U	0.021 U	0.01 U	0.032 UJ	0.019 U
Styrene	21000	2700	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Tetrachloroethene	17	8.9	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.002 J	0.01 U	0.011 U	0.011 U
Toluene	2600	380	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
trans-1,3-Dichloropropene	na	na	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Trichloroethene	8.5	6	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Vinyl chloride	0.04	0.03	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Xylene (Total)	40000	5900	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S001602	030S001702	030S001802	030S002002	030S005302	030S005902	030S006102	030S010101	030S010201
1,1,1-Trichloroethane	3300	400	0.011 U	0.004 J	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,1-Dichloroethane	2000	290	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,2-Dichloroethene (total)	130	19	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
2-Butanone (MEK)	21000	3100	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011
2-Hexanone	34	5.1	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 UJ
4-Methyl-2-Pentanone (MIBK)	1500	220	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 UJ
Acetone	5500	780	0.52 DUJ	0.023 UJ	0.043 U	3.3 DU	0.4 D	0.011 U	0.45 U	0.01 U	0.15 J
Benzene	1.6	1.1	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.001 J
Bromodichloromethane	2	1.4	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Bromoform	84	48	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Bromomethane	15	2.2	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Carbon disulfide	1400	200	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Chlorobenzene	200	30	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Chloroethane	na	2.9	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Chloroform	0.5	0.4	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Chloromethane	2.3	1.7	0.011 U	0.01 UJ	0.01 U	0.01 U	0.011 UJ	0.011 U	0.011 U	0.01 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Dibromochloromethane	2.1	1.4	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Ethylbenzene	8400	1100	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Methylene chloride	23	16	0.02 U	0.01 U	0.027 U	0.032 U	0.031	0.011 U	0.011 U	0.011 U	0.014 UJ
Styrene	21000	2700	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Tetrachloroethene	17	8.9	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Toluene	2600	380	0.011 U	0.01 U	0.01 JU	0.01 U	0.011 U	0.011 U	0.011 U	0.002 J	0.005 J
trans-1,3-Dichloropropene	na	na	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Trichloroethene	8.5	6	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Vinyl chloride	0.04	0.03	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Xylene (Total)	40000	5900	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.002 J

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S010202	030S010301	030S010401	030S010502	030S010601	030S010802	030S010901	030S011001	030S011102
1,1,1-Trichloroethane	3300	400	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.011 U	0.011 U		0.01 UJ	0.01 U	0.011 U	0.01 U	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,1-Dichloroethane	2000	290	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
2-Butanone (MEK)	21000	3100	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
2-Hexanone	34	5.1	0.01 U	0.011 UJ	0.011 U		0.01 UJ	0.01 U	0.011 U	0.01 U	0.01 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.011 U	0.011 U		0.01 UJ	0.01 U	0.011 U	0.01 U	0.01 U
Acetone	5500	780	0.034 U	1 D	0.072 U	0.04 U	0.023 U	0.12	0.32 DU	0.019 U	0.99 D
Benzene	1.6	1.1	0.01 U	0.011 U	0.011 U	0.002 J	0.005 J	0.01 U	0.011 U	0.01 U	0.01 U
Bromodichloromethane	2	1.4	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Bromoform	84	48	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Bromomethane	15	2.2	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Carbon disulfide	1400	200	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.001 J
Chlorobenzene	200	30	0.01 U	0.011 U	0.011 U		0.01 UJ	0.01 U	0.011 U	0.01 U	0.01 U
Chloroethane	na	2.9	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Chloroform	0.5	0.4	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Chloromethane	2.3	1.7	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Dibromochloromethane	2.1	1.4	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Ethylbenzene	8400	1100	0.01 U	0.011 U	0.011 U		0.01 UJ	0.01 U	0.011 U	0.01 U	0.002 J
Methylene chloride	23	16	0.011 U	0.011 UJ	0.011 U	0.024 U	0.042 U	0.01 U	0.011 U	0.01 U	0.01 U
Styrene	21000	2700	0.01 U	0.011 U	0.011 U		0.01 UJ	0.01 U	0.011 U	0.01 U	0.01 U
Tetrachloroethene	17	8.9	0.01 U	0.011 U	0.011 U		0.01 UJ	0.01 U	0.011 U	0.01 U	0.01 U
Toluene	2600	380	0.01 U	0.011 U	0.002 J		0.032 J	0.01 U	0.011 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Trichloroethene	8.5	6	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Vinyl chloride	0.04	0.03	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U
Xylene (Total)	40000	5900	0.01 U	0.011 U	0.011 U		0.002 J	0.01 U	0.011 U	0.01 U	0.005 J

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S011201	030S011301	030S011401	030S011501	030S011601	030S011701	030S011802	030S012001	030S012101
1,1,1-Trichloroethane	3300	400	0.01 U	0.011 UJ	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.01 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
1,1-Dichloroethane	2000	290	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
2-Butanone (MEK)	21000	3100	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
2-Hexanone	34	5.1	0.01 U	0.011 UJ	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.011 U
Acetone	5500	780	0.022 UJ	1.4 DU	0.042 U	0.077 UJ	0.02 U	0.027 UJ	0.44 J	0.02 UJ	0.018 UJ
Benzene	1.6	1.1	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.002 J	0.002 J
Bromodichloromethane	2	1.4	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Bromoform	84	48	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Bromomethane	15	2.2	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Carbon disulfide	1400	200	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.011 UJ	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.003 J	0.006 J
Chlorobenzene	200	30	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.011 U
Chloroethane	na	2.9	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Chloroform	0.5	0.4	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U
Chloromethane	2.3	1.7	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Dibromochloromethane	2.1	1.4	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Ethylbenzene	8400	1100	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.01 U
Methylene chloride	23	16	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.019 UJ	0.011 U
Styrene	21000	2700	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.011 U
Tetrachloroethene	17	8.9	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.011 U
Toluene	2600	380	0.032	0.011 U	0.01 U	0.011 U	0.008 J	0.001 J	0.016 J	0.013 J	0.011 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.01 U
Trichloroethene	8.5	6	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Vinyl chloride	0.04	0.03	0.01 U	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U
Xylene (Total)	40000	5900	0.002 J	0.011 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U	0.003 J	0.002 J

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S012201	030S012301	030S012401	030S012501	030S012602	030S012701	030S012801	030S012901	030S013001
1,1,1-Trichloroethane	3300	400	0.01 U	0.01 UJ	0.011 UJ	0.011 UJ	1.3 U	0.002 J	0.01 U	0.011 U	0.014 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 UJ	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U		0.011 UJ	0.014 UJ
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
1,1-Dichloroethane	2000	290	0.01 U	0.01 U	0.011 U	0.011 U	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.01 U	0.011 U	0.011 U	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
1,2-Dichloroethane	0.7	0.5	0.01 U	0.01 U	0.021 J	0.05 J	1.3 U	0.045	0.01 U	0.011 U	0.009 J
1,2-Dichloroethene (total)	130	19	0.01 U	0.01 U	0.011 U	0.011 U	1.3 UJ	0.01 U	0.01 U	0.011 U	0.014 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
2-Butanone (MEK)	21000	3100	0.01 U	0.01 U	0.011 U	0.011 U	1.3 UJ	0.01 U	0.01 U	0.011 U	0.014 U
2-Hexanone	34	5.1	0.01 UJ	0.01 U	0.011 UJ	0.011 UJ	1.3 UJ	0.01 U		0.011 UJ	0.014 UJ
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 UJ	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U		0.011 UJ	0.014 UJ
Acetone	5500	780	0.025 U	0.039 DU	0.011 U	0.011 U	3 UJ	0.01 UJ	0.01 U	0.011 U	0.11 U
Benzene	1.6	1.1	0.002 J	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Bromodichloromethane	2	1.4	0.01 U	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Bromoform	84	48	0.01 U	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Bromomethane	15	2.2	0.01 U	0.01 U	0.011 U	0.011 U	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Carbon disulfide	1400	200	0.01 U	0.01 U	0.011 U	0.011 U	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.01 UJ	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Chlorobenzene	200	30	0.01 UJ	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U		0.011 UJ	0.014 UJ
Chloroethane	na	2.9	0.01 U	0.01 U	0.011 U	0.011 U	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Chloroform	0.5	0.4	0.01 U	0.01 U	0.011 U	0.011 U	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Chloromethane	2.3	1.7	0.01 U	0.01 U	0.011 U	0.011 U	1.3 UJ	0.01 U	0.01 U	0.011 U	0.014 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Dibromochloromethane	2.1	1.4	0.01 U	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Ethylbenzene	8400	1100	0.002 J	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U		0.011 UJ	0.014 UJ
Methylene chloride	23	16	0.015 U	0.01 U	0.011 U	0.025 U	1.3 UJ	0.01 U	0.014 U	0.013 U	0.014 U
Styrene	21000	2700	0.01 UJ	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U		0.011 UJ	0.014 UJ
Tetrachloroethene	17	8.9	0.01 UJ	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U		0.011 UJ	0.014 UJ
Toluene	2600	380	0.037 J	0.01 U	0.011 UJ	0.015 U	1.3 U	0.012	0.043 J	0.017 UJ	0.014 UJ
trans-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Trichloroethene	8.5	6	0.01 U	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Vinyl chloride	0.04	0.03	0.01 U	0.01 U	0.011 U	0.011 U	1.3 U	0.01 U	0.01 U	0.011 U	0.014 U
Xylene (Total)	40000	5900	0.01 UJ	0.01 U	0.011 UJ	0.011 UJ	1.3 U	0.001 J		0.011 UJ	0.014 UJ

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S013401	030S013501	030S013701	030S013801	030S013901	030S014001	030S014101	030S014201	030S014301
1,1,1-Trichloroethane	3300	400	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
1,1,2,2-Tetrachloroethane	1.1	0.7	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 UJ	0.011 U	0.01 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
1,1-Dichloroethane	2000	290	0.013 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.013 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.013 U	0.01 U	0.096	0.01 J	0.033	0.027	0.018	0.002 J	0.011 U
1,2-Dichloroethene (total)	130	19	0.013 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
2-Butanone (MEK)	21000	3100	0.013 U	0.01 U	0.011 U	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
2-Hexanone	34	5.1	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 UJ	0.011 U	0.01 U	0.011 U
4-Methyl-2-Pentanone (MIBK)	1500	220	0.013 UJ	0.01 UJ	0.011 UJ	0.011 U	0.011 UJ	0.01 UJ	0.011 U	0.01 U	0.011 U
Acetone	5500	780	0.15 J	0.05 UJ	0.011 U	0.061 U	0.011 U	0.1 J	0.04 U	0.01 U	0.011 U
Benzene	1.6	1.1	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
Bromodichloromethane	2	1.4	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
Bromoform	84	48	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
Bromomethane	15	2.2	0.013 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U
Carbon disulfide	1400	200	0.013 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
Chlorobenzene	200	30	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 UJ	0.011 U	0.01 U	0.011 U
Chloroethane	na	2.9	0.013 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U
Chloroform	0.5	0.4	0.013 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U
Chloromethane	2.3	1.7	0.013 UJ	0.01 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.011 U	0.01 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
Dibromochloromethane	2.1	1.4	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
Ethylbenzene	8400	1100	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 UJ	0.011 U	0.01 U	0.011 U
Methylene chloride	23	16	0.024 U	0.011 U	0.025 U	0.011 U	0.027 U	0.033 U	0.011 U	0.01 U	0.021 U
Styrene	21000	2700	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 UJ	0.011 U	0.01 U	0.011 U
Tetrachloroethene	17	8.9	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 UJ	0.011 U	0.01 U	0.011 U
Toluene	2600	380	0.005 J	0.004 J	0.023 J	0.011 U	0.017 J	0.011 J	0.011 U	0.01 U	0.003 J
trans-1,3-Dichloropropene	na	na	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
Trichloroethene	8.5	6	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 U	0.011 U	0.01 U	0.011 U
Vinyl chloride	0.04	0.03	0.013 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 UJ	0.011 U	0.01 U	0.011 U
Xylene (Total)	40000	5900	0.013 U	0.01 U	0.011 UJ	0.011 U	0.011 UJ	0.01 UJ	0.011 U	0.01 U	0.011 U

Table B-10: Summary of Surface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	C/I Direct Exposure SCTL	Residential Direct Exposure SCTL	030S014401	030S014501	030S014701	030S014801	030S014901	030S015001	030S015002	030S015101	030S015302
1,1,1-Trichloroethane	3300	400	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 UJ
1,1,2,2-Tetrachloroethane	1.1	0.7	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
1,1,2-Trichloroethane	1.8	1.3	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
1,1-Dichloroethane	2000	290	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
1,1-Dichloroethene	0.1	0.09	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
1,2-Dichloroethane	0.7	0.5	0.025	0.01 U	0.023	0.023	0.011 U	0.016	1.3 U	0.019	0.011 U
1,2-Dichloroethene (total)	130	19	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
1,2-Dichloropropane	0.8	0.6	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
2-Butanone (MEK)	21000	3100	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
2-Hexanone	34	5.1	0.01 U	0.01 UJ	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 UJ
4-Methyl-2-Pentanone (MIBK)	1500	220	0.01 U	0.01 UJ	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Acetone	5500	780	0.01 U	0.039 UJ	0.056 U	0.11 U	0.011 U	0.13 U	1.3 U	0.011 U	0.049 UJ
Benzene	1.6	1.1	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Bromodichloromethane	2	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Bromoform	84	48	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Bromomethane	15	2.2	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 UJ	0.011 U	0.011 U
Carbon disulfide	1400	200	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Carbon tetrachloride	0.6	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 UJ
Chlorobenzene	200	30	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Chloroethane	na	2.9	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Chloroform	0.5	0.4	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Chloromethane	2.3	1.7	0.01 U	0.01 UJ	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
cis-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Dibromochloromethane	2.1	1.4	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Ethylbenzene	8400	1100	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Methylene chloride	23	16	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.014 U	0.012 U
Styrene	21000	2700	0.01 U	0.01 U	0.003 J	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Tetrachloroethene	17	8.9	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Toluene	2600	380	0.01 U	0.002 J	0.002 J	0.011 U	0.011 U	0.01 U	1.3 U	0.002 J	0.011 U
trans-1,3-Dichloropropene	na	na	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Trichloroethene	8.5	6	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Vinyl chloride	0.04	0.03	0.01 U	0.01 UJ	0.011 U	0.011 U	0.011 U	0.01 U	1.3 U	0.011 U	0.011 U
Xylene (Total)	40000	5900	0.01 U	0.01 U	0.011 U	0.001 J	0.011 U	0.002 J	1.3 U	0.011 U	0.011 U

Table B-11: Summary of Subsurface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	Leachability	011S000606				030S001220				030S001706				030S001718				030S005302				030S005304			
Parameter	Based SCTL	1993		2003		1993		2003		1993		2003		1993		2003		1993		2003		1993		2003	
1,1,1-Trichloroethane	1900	10	UJ	0.59	U	12	U	130	U	11	U	0.63	U	11	U	0.5	U	11	U	0.65	U	10	U	0.68	U
1,1,2,2-Tetrachloroethane	10	10	UJ	0.62	U	12	UR	93	U	11	U	0.67	U	11	U	0.53	U	11	U	0.68	U	10	U	0.72	U
1,1,2-Trichloroethane	30	10	UJ	1.1	U	12	U	48	U	11	U	1.1	U	11	U	0.91	U	11	U	1.2	U	10	U	1.2	U
1,1-Dichloroethane	400	10	UJ	0.88	U	12	U	41	U	11	U	0.94	U	11	U	0.75	U	11	U	0.96	U	10	U	1	U
1,1-Dichloroethene	60	10	UJ	0.64	U	12	U	96	U	11	U	0.68	U	11	U	0.54	U	11	U	0.7	U	10	U	0.73	U
1,2-Dichloroethane	10	2	J	0.72	U	12	U	120	U	11	U	0.77	U	11	U	0.62	U	11	U	0.79	U	10	U	0.83	U
1,2-Dichloroethene (total)	1100	10	UJ	na		12	U	na		11	U	na		11	U	na		11	U	na		10	U	na	
1,2-Dichloropropane	30	10	UJ	0.71	U	12	U	110	U	11	U	0.76	U	11	U	0.61	U	11	U	0.78	U	10	U	0.82	U
2-Butanone (MEK)	17000	10	UJ	3.2	U	12	U	300	U	1	J	1.6	U	11	U	1.1	U	11	U	0.34	U	10	U	0.35	U
2-Hexanone	1400	10	UJ	0.47	U	12	UR	590	U	11	U	0.5	U	11	U	0.4	U	11	U	0.52	U	10	U	0.54	U
4-Methyl-2-Pentanone (MIBK)	2600	10	UJ	0.42	U	12	UR	160	U	11	U	0.44	U	11	U	0.36	U	11	U	0.46	U	10	U	0.48	U
Acetone	2800	10	UJ	5.5	U	39	UD	600	U	140	J	5.8	U	48	U	4.7	U	400	D	6	U	41	U	6.3	U
Benzene	7	10	UJ	0.42	U	12	U	54	U	11	U	0.44	U	11	U	0.36	U	11	U	0.46	U	10	U	0.48	U
Bromodichloromethane	4	10	UJ	0.34	U	12	U	100	U	11	U	0.36	U	11	U	0.29	U	11	U	0.37	U	10	U	0.39	U
Bromoform	30	10	UJ	0.74	U	12	U	53	U	11	U	0.8	U	11	U	0.64	U	11	U	0.82	U	10	U	0.85	U
Bromomethane	50	10	UJ	0.62	U	12	UR	120	U	11	U	0.67	U	11	U	0.53	U	11	U	0.68	U	10	U	0.72	U
Carbon disulfide	5600	10	UJ	0.44	U	12	U	130	U	11	U	0.47	U	11	U	0.37	U	11	U	0.48	U	10	U	0.5	U
Carbon tetrachloride	40	10	UJ	0.38	U	12	U	140	U	11	U	0.41	U	11	U	0.33	U	11	U	0.42	U	10	U	0.44	U
Chlorobenzene	1300	10	UJ	0.81	U	12	UR	73	U	11	U	0.87	U	11	U	0.69	U	11	U	0.89	U	10	U	0.93	U
Chloroethane	NA	10	UJ	0.62	U	12	U	120	U	11	U	0.67	U	11	U	0.53	U	11	U	0.68	U	10	U	0.72	U
Chloroform	30	10	UJ	0.48	U	12	U	46	U	11	U	0.52	U	11	U	0.41	U	11	U	0.53	U	10	U	0.55	U
Chloromethane	10	10	UJ	1.5	U	12	U	120	U	11	UJ	1.6	U	11	UJ	1.3	U	11	UJ	1.7	U	10	UJ	1.8	U
cis-1,2-Dichloroethene	400	na		0.43	U	na		68	U	na		0.46	U	na		0.36	U	na		0.47	U	na		0.49	U
cis-1,3-Dichloropropene	1	10	UJ	0.77	U	12	U	120	U	11	U	0.82	U	11	U	0.66	U	11	U	0.84	U	10	U	0.88	U
Dibromochloromethane	3	10	UJ	0.43	U	12	U	77	U	11	U	0.46	U	11	U	0.36	U	11	U	0.47	U	10	U	0.49	U
Ethylbenzene	600	10	UJ	2.9	J	12	UR	59	U	11	U	0.75	U	11	U	0.28	U	11	U	1.4	U	10	U	0.86	U
Methylene chloride	20	24	UJ	1.3	J	12	U	60	U	11		1.4	J	**31**		0.93	J	**31**		1.2	J	**25**		1.2	J
Styrene	3600	10	UJ	0.58	U	12	UR	150	U	11	U	0.62	U	11	U	0.5	U	11	U	0.64	U	10	U	0.67	U
Tetrachloroethene	30	**270**	DJ	**30**		12	UR	100	U	11	U	1.3	J	11	U	0.92	U	11	U	1.2	U	10	U	1.2	U
Toluene	500	3	DJ	0.71	U	12	UR	74	U	11	U	0.76	U	11	U	0.61	U	11	U	0.78	U	10	U	0.82	U
trans-1,2-Dichloroethene	700	na		0.88	U	na		61	U	na		0.94	U	na		0.75	U	na		0.96	U	na		1	U
trans-1,3-Dichloropropene	1	10	UJ	1.1	U	12	U	69	U	11	U	1.2	U	11	U	0.94	U	11	U	1.2	U	10	U	1.2	U
Trichloroethene	30	10	UJ	0.84	U	12	U	120	U	11	U	0.9	U	11	U	0.72	U	11	U	0.92	U	10	U	0.97	U
Vinyl chloride	7	10	UJ	1.6	U	12	U	120	U	11	U	1.8	U	11	U	1.4	U	11	U	1.8	U	10	U	1.9	U
Xylene (Total)	200	10	UJ	15		12	UR	160	U	11	U	1.1	U	11	U	0.91	U	11	U	8	J	10	U	4.9	J

Notes:
All concentrations expressed in micrograms per kilogram
Bolding indicates the value exceeds the SCTL
Blank cells indicate that the sample was not collected or analyzed for that parameter
D - detection from a diluted sample
U - not detected
J - present below the method detection limit but above the instrument detection limit
R - rejected due to variance from quality control criteria
NA - not applicable
na - not analyzed

Table B-11: Summary of Subsurface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	Leachability Based SCTL	030S005310				030S012006		030S012005		030S012403				030S012503				030S012505				030S013706			
		1993		2003		1993		2003		1993		2003		1993		2003		1993		2003		1993		2003	
1,1,1-Trichloroethane	1900	10	U	0.62	U	11	U	0.83	U	11	U	0.7	U	10	U	0.75	U	10	U	0.64	U	10	U	0.62	U
1,1,2,2-Tetrachloroethane	10	10	U	0.65	U	11	U	0.87	U	11	U	0.74	U	10	U	0.79	U	10	U	0.68	U	10	U	0.65	U
1,1,2-Trichloroethane	30	10	U	1.1	U	11	U	1.5	U	11	U	1.2	U	10	U	1.4	U	10	U	1.2	U	10	U	1.1	U
1,1-Dichloroethane	400	10	UJ	0.92	U	11	U	1.2	U	11	U	1	U	10	U	1.1	U	10	U	0.95	U	10	U	0.92	U
1,1-Dichloroethene	60	10	U	0.66	U	11	U	0.89	U	11	U	0.75	U	10	U	0.81	U	10	U	0.69	U	10	U	0.66	U
1,2-Dichloroethane	10	10	U	0.76	U	11	U	1	U	**10**	J	0.85	U	8	J	0.92	U	**11**		0.78	U	**11**		0.76	U
1,2-Dichloroethene (total)	1100	10	U	na		11	U	na		11	U	na		10	U	na		10	U	na		10	U	na	
1,2-Dichloropropane	30	10	U	0.74	U	11	U	0.99	U	11	U	0.84	U	10	U	0.9	U	10	U	0.77	U	10	U	0.74	U
2-Butanone (MEK)	17000	10	U	0.32	U	11	U	2.4	U	11	U	0.36	U	10	U	2.3	U	10	U	0.33	U	10	U	0.32	U
2-Hexanone	1400	10	U	0.49	U	11	UJ	0.66	U	11	U	0.56	U	10	U	0.6	U	10	U	0.51	U	10	U	0.49	U
4-Methyl-2-Pentanone (MIBK)	2600	10	U	0.44	U	11	UJ	0.58	U	11	U	0.49	U	10	U	0.53	U	10	U	0.45	U	10	U	0.44	U
Acetone	2800	41	U	5.7	U	61	UJ	7.6	U	66	U	19	J	10	U	31	J	10	U	6	U	54	U	5.7	U
Benzene	7	10	U	0.44	U	3	J	0.58	U	11	U	0.49	U	10	U	0.53	U	10	U	0.45	U	10	U	0.44	U
Bromodichloromethane	4	10	U	0.36	U	11	U	0.47	U	11	U	0.4	U	10	U	0.43	U	10	U	0.37	U	10	U	0.36	U
Bromoform	30	10	U	0.78	U	11	U	1	U	11	U	0.88	U	10	U	0.95	U	10	U	0.81	U	10	U	0.78	U
Bromomethane	50	10	UJ	0.65	U	11	U	0.87	U	11	U	0.74	U	10	U	0.79	U	10	U	0.68	U	10	U	0.65	U
Carbon disulfide	5600	10	U	0.46	U	11	U	0.61	U	11	U	0.52	U	10	U	0.56	U	10	U	0.48	U	10	U	0.46	U
Carbon tetrachloride	40	10	U	0.4	U	11	U	0.54	U	11	U	0.45	U	10	U	0.49	U	10	U	0.42	U	10	U	0.4	U
Chlorobenzene	1300	10	U	0.85	U	11	U	1.1	U	11	U	0.96	U	10	U	1	U	10	U	0.88	U	10	U	0.85	U
Chloroethane	NA	10	UJ	0.65	U	11	U	0.87	U	11	U	0.74	U	10	U	0.79	U	10	U	0.68	U	10	U	0.65	U
Chloroform	30	10	U	0.5	U	11	U	0.67	U	11	U	0.57	U	10	U	0.61	U	10	U	0.52	U	10	U	0.5	U
Chloromethane	10	10	U	1.6	U	11	U	2.1	U	11	U	1.8	U	10	U	2	U	10	U	1.7	U	10	U	1.6	U
cis-1,2-Dichloroethene	400	na		0.45	U	na		0.6	U	na		0.5	U	na		0.54	U	na		0.46	U	na		0.45	U
cis-1,3-Dichloropropene	1	10	U	0.8	U	11	U	1.1	U	11	U	0.9	U	10	U	0.98	U	10	U	0.83	U	10	U	0.8	U
Dibromochloromethane	3	10	U	0.45	U	11	U	0.6	U	11	U	0.5	U	10	U	0.54	U	10	U	0.46	U	10	U	0.45	U
Ethylbenzene	600	10	U	0.62	U	2	J	0.46	U	11	U	0.39	U	10	U	0.42	U	10	U	0.36	U	10	U	13	
Methylene chloride	20	**22**		1.3	J	19	UJ	1.6	U	11	U	1.3	U	10	U	1.3	U	10	U	1.4	U	10	U	1	J
Styrene	3600	10	U	0.61	U	11	U	0.81	U	11	U	0.68	U	10	U	0.74	U	10	U	0.63	U	10	U	0.61	U
Tetrachloroethene	30	10	U	1.1	U	11	U	1.5	U	11	U	1.3	U	10	U	1.4	U	10	U	1.2	U	10	U	1.1	U
Toluene	500	10	U	0.74	U	12		0.99	U	11	U	0.84	U	10	U	0.9	U	10	U	0.77	U	3	J	0.74	U
trans-1,2-Dichloroethene	700	na		0.92	U	na		1.2	U	na		1	U	na		1.1	U	na		0.95	U	na		0.92	U
trans-1,3-Dichloropropene	1	10	U	1.1	U	11	U	1.5	U	11	U	1.3	U	10	U	1.4	U	10	U	1.2	U	10	U	1.1	U
Trichloroethene	30	10	U	0.88	U	11	U	1.2	U	11	U	0.99	U	10	U	1.1	U	10	U	0.92	U	10	U	0.88	U
Vinyl chloride	7	10	U	1.7	U	11	U	2.3	U	11	U	1.9	U	10	U	2.1	U	10	U	1.8	U	10	U	1.7	U
Xylene (Total)	200	10	U	3.2	U	11	U	1.5	U	11	U	1.2	U	10	U	1.4	U	10	U	1.2	U	10	U	80	

Table B-11: Summary of Subsurface Soil VOCs
NAS Pensacola, Operable Unit 2

Parameter	Leachability Based SCTL	030S013806 1993		030S013806 2003		030S013820 2003		030S014206 1993		030S014206 2003		030S014806 1993		030S014806 2003		030S015016 8/9/1993		030S015016 9/29/1993		030S015016 2003	
1,1,1-Trichloroethane	1900	11	U	0.6	U	240	U	8	J	0.74	U	12	U	0.6	U	11	U	10	U	0.62	U
1,1,2,2-Tetrachloroethane	10	11	U	0.64	U	170	U	10	U	0.78	U	12	U	0.64	U	11	U	10	U	0.66	U
1,1,2-Trichloroethane	30	11	U	1.1	U	88	U	10	U	1.3	U	12	U	1.1	U	11	U	10	U	1.1	U
1,1-Dichloroethane	400	11	U	0.9	U	75	U	10	U	1.1	U	12	U	0.9	U	11	U	10	U	0.92	U
1,1-Dichloroethene	60	11	U	0.65	U	180	U	10	U	0.79	U	12	U	0.65	U	11	U	10	U	0.67	U
1,2-Dichloroethane	10	**13**		0.74	U	210	U	8	J	0.9	U	**20**		0.74	U	11	U	**10**	J	0.76	U
1,2-Dichloroethene (total)	1100	11	U	na		na		10	U	na		12	U	na		11	U	10	U	na	
1,2-Dichloropropane	30	11	U	0.73	U	200	U	10	U	0.89	U	12	U	0.73	U	11	U	10	U	0.75	U
2-Butanone (MEK)	17000	11	U	4.2	U	360	U	10	U	0.38	U	12	U	0.31	U	11	U	10	U	0.32	U
2-Hexanone	1400	11	U	0.48	U	1100	U	10	U	0.59	U	12	U	0.48	U	11	U	10	U	0.5	U
4-Methyl-2-Pentanone (MIBK)	2600	11	U	1.5	J	300	U	10	U	0.52	U	12	U	0.42	U	11	U	10	U	0.44	U
Acetone	2800	94	U	5.6	U	1100	U	52		6.8	U	98	U	5.6	U	99	J	110	U	5.8	U
Benzene	7	11	U	0.42	U	99	U	10	U	0.52	U	12	U	0.42	U	11	U	10	U	0.44	U
Bromodichloromethane	4	11	U	0.35	U	180	U	10	U	0.42	U	12	U	0.35	U	11	U	10	U	0.36	U
Bromoform	30	11	U	0.76	U	96	U	10	U	0.93	U	12	U	0.76	U	11	U	10	U	0.79	U
Bromomethane	50	11	U	0.64	U	210	U	10	U	0.78	U	12	U	0.64	U	11	U	10	U	0.66	U
Carbon disulfide	5600	11	U	0.45	U	170	U	10	U	0.54	U	12	U	0.45	U	11	U	10	U	0.46	U
Carbon tetrachloride	40	11	U	0.39	U	260	U	10	U	0.48	U	12	U	0.39	U	11	U	10	U	0.4	U
Chlorobenzene	1300	11	U	0.83	U	130	U	10	U	1	U	12	U	0.83	U	11	U	10	U	0.86	U
Chloroethane	NA	11	U	0.64	U	210	U	10	U	0.78	U	12	U	0.64	U	11	U	10	U	0.66	U
Chloroform	30	11	U	0.49	U	84	U	10	U	0.6	U	12	U	0.49	U	11	U	10	U	0.51	U
Chloromethane	10	11	U	1.6	U	210	U	10	U	1.9	U	12	U	1.6	U	11	UJ	10	U	1.6	U
cis-1,2-Dichloroethene	400	na		0.44	U	120	U	na		0.53	U	na		0.44	U	na		na		0.45	U
cis-1,3-Dichloropropene	1	11	U	0.78	U	210	U	10	U	0.95	U	12	U	0.78	U	11	U	10	U	0.81	U
Dibromochloromethane	3	11	U	0.44	U	140	U	10	U	0.53	U	12	U	0.44	U	11	U	10	U	0.45	U
Ethylbenzene	600	11	U	0.34	U	**19000**		10	U	0.41	U	12	U	0.43	U	11	U	10	U	0.81	U
Methylene chloride	20	11	U	1.3	J	110	U	10	U	1.4	J	12	U	1	J	23	U	10	U	1.4	J
Styrene	3600	11	U	0.59	U	280	U	10	U	0.72	U	12	U	0.59	U	11	U	10	U	0.61	U
Tetrachloroethene	30	11	U	1.1	U	**220**	J	3	J	1.3	U	12	U	1.1	U	11	U	10	U	1.1	U
Toluene	500	11	U	0.73	U	420	J	2	J	0.89	U	12	U	0.73	U	11	U	10	U	0.75	U
trans-1,2-Dichloroethene	700	na		0.9	U	110	U	na		1.1	U	12	U	0.9	U	na		na		0.92	U
trans-1,3-Dichloropropene	1	11	U	1.1	U	130	U	10	U	1.4	U	12	U	1.1	U	11	U	10	U	1.2	U
Trichloroethene	30	11	U	0.86	U	210	U	10	U	1	U	12	U	0.86	U	11	U	10	U	0.89	U
Vinyl chloride	7	11	U	1.7	U	210	U	10	U	2	U	12	U	1.7	U	11	U	10	U	1.7	U
Xylene (Total)	200	11	U	1.1	U	**110000**		10	U	3.2	U	12	U	1.1	U	11	U	10	U	4	J

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	11GI02			11GI08		11GI10		11GI12			11GI14			11GI15	
				1993	1995	2003	1993	2003	1993	2003	1993	1995	2003	1993	1995	2003	1993	2003
Acetone	760	1700	1700	10 U	5 U	17 U	10 U	13 U	10 U	2.3 U	10 U	7 UJ	7.4 U	50 U	11 UJ	8.8 U	140	6.7 U
Benzene	1	71.28	71.28	10 U	1 U	0.096 U	10 U	0.12 U	10 U	0.096 U	10 U	1 UJ	0.096 U	50 U	1 U	0.24 U	10 U	0.096 U
Bromodichloromethane	0.6	22	22	10 U	0.6 U	0.18 U	10 U	0.18 U	10 U	0.18 U	10 U	0.6 UJ	0.18 U	50 U	0.6 U	0.45 U	10 U	0.18 U
Bromoform	4.8	360	360	10 U	1 U	0.19 U	10 U	0.19 U	10 U	0.19 U	10 U	1 UJ	0.19 U	50 U	1 U	0.47 U	10 U	0.19 U
Bromomethane	11	35	35	10 U	1 UJ	0.49 U	10 U	0.49 U	10 U	0.49 U	10 U	1 UJ	0.49 U	50 U	1 UJ	1.2 U	10 U	0.49 U
2-Butanone (MEK)	4600	120000	120000	10 U	5 U	0.85 U	10 U	1.8 U	10 U	0.51 U	10 U	5 UJ	0.48 U	50 U	5 U	1.2 U	10 U	1.6 U
Carbon disulfide	760	110	110	10 U	1 U	0.72 U	10 U	0.72 U	10 U	0.72 U	10 U	1 UJ	0.72 U	50 U	1 U	1.8 U	1 J	0.72 U
Carbon tetrachloride	3	4.42	4.42	10 U	1 U	0.15 U	10 U	0.15 U	10 U	0.15 U	10 U	1 UJ	0.15 U	50 U	1 UJ	0.38 U	10 U	0.15 U
Chlorobenzene	100	17	17	10 U	1 U	0.1 U	10 U	0.1 U	10 U	0.1 U	10 U	1 UJ	0.1 U	50 U	1 U	0.25 U	10 U	0.1 U
Chloroethane	13	NA	NA	10 U	1 U	0.86 U	10 U	0.86 U	10 U	0.86 U	10 U	1 UJ	0.86 U	50 U	1 U	2.2 U	10 U	0.86 U
Chloroform	76	470.8	470.8	10 U	1 U	0.12 U	10 U	0.12 U	1 J	0.12 U	10 U	1 UJ	0.12 U	50 U	1 U	0.3 U	10 U	0.12 U
Chloromethane	2.9	470.8	470.8	10 U	1 U	0.4 U	10 U	0.4 U	10 U	0.4 U	10 U	1 UJ	0.4 U	50 U	1 U	1 U	10 U	0.4 U
Dibromochloromethane	0.5	34	34	10 U	1 U	0.078 U	10 U	0.078 U	10 U	0.078 U	10 U	1 UJ	0.078 U	50 U	1 U	0.19 U	10 U	0.078 U
1,1-Dichloroethane	76	NA	NA	10 U	5	5.2	10 U	0.12 U	10 U	0.12 U	10 U	1 UJ	8.1	50 U	0.1 J	5.4	10 U	0.12 U
1,2-Dichloroethane	3	40	40	10 U	1 U	0.18 U	10 U	0.18 U	**9** J	**8.5**	10 U	1 UJ	0.18 U	50 U	0.2 J	0.45 U	10 U	0.18 U
1,1-Dichloroethene	7	3.2	3.2	10 U	0.4 J	0.58 J	10 U	0.31 U	10 U	0.31 U	10 U	1 UJ	1.1	50 U	0.9 J	4.7	10 U	0.31 U
cis-1,2-Dichloroethene	70	NA	NA	na	15	38	na	0.16 U	na	1.2	na	32 J	**88**	na	**240** D	**360**	na	0.16 U
trans-1,2-Dichloroethene	100	11000	11000	na	0.2 J	0.36 U	na	0.36 U	na	0.36 U	na	1 UJ	0.65 J	na	1	3.2	na	0.36 U
1,2-Dichloroethene (total)	NA	7000	7000	16	na	na	10 U	na	3 J	na	110	na	na	580	na	na	10 U	na
1,2-Dichloropropane	5	16	16	10 U	1 U	0.17 U	10 U	0.17 U	10 U	0.17 U	10 U	1 UJ	0.17 U	50 U	3 J	0.42 U	10 U	0.17 U
cis-1,3-Dichloropropene	0.4*	12*	12*	10 U	1 U	0.12 U	10 U	0.12 U	10 U	0.12 U	10 U	1 UJ	0.12 U	50 U	1 U	0.3 U	10 U	0.12 U
trans-1,3-Dichloropropene	0.4*	12*	12*	10 U	1 U	0.15 U	10 U	0.15 U	10 U	0.15 U	10 U	1 UJ	0.15 U	50 U	1 U	0.38 U	10 U	0.15 U
Ethylbenzene	30	610	610	10 U	1 U	0.11 U	10 U	0.11 U	10 U	0.11 U	10 U	1 UJ	0.11 U	50 U	1 U	0.28 U	10 U	0.11 U
2-Hexanone	300	NA	NA	10 U	5 U	0.29 U	10 U	0.29 U	10 U	0.29 U	10 U	5 UJ	0.29 U	50 U	5 U	0.72 U	10 U	0.29 U
Methylene chloride	5	1580	1580	10 U	2 U	0.61 U	10 U	0.61 U	10 U	0.61 U	10 U	2 UJ	0.61 U	50 U	2 U	1.5 U	10 U	0.61 U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	10 U	5 U	0.27 U	10 U	0.27 U	10 U	0.27 U	10 U	5 UJ	0.27 U	50 U	5 U	0.68 U	10 U	0.27 U
Styrene	100	460	460	10 U	1 U	0.22 U	10 U	0.38 U	10 U	0.05 U	10 U	1 UJ	0.18 U	50 U	1 U	0.12 U	10 U	0.087 U
Tetrachloroethene	3	8.85	8.85	10 U	0.3 J	**25**	10 U	0.43 U	10 U	0.43 U	10 U	1 UJ	**3.5**	50 U	1 U	1.1 U	10 U	0.43 U
1,1,2,2-Tetrachloroethane	0.2	10.8	10.8	10 U	0.2 U	0.17 U	10 U	0.17 U	10 U	0.17 U	10 U	0.2 UJ	0.17 U	50 U	0.2 U	0.42 U	10 U	0.17 U
1,1,1-Trichloroethane	200	270	270	10 U	1 U	0.065 U	10 U	0.065 U	10 U	0.065 U	10 U	1 UJ	0.065 U	50 U	1 U	0.16 U	10 U	0.065 U
1,1,2-Trichloroethane	5	17	17	10 U	1 U	0.11 U	10 U	0.11 U	10 U	0.11 U	10 U	1 UJ	0.11 U	50 U	1 U	0.28 U	10 U	0.11 U
Trichloroethene	3	80.7	80.7	**3** J	**3**	**22**	10 U	0.13 U	10 U	0.62 J	**14**	**11** J	**14**	50 U	1	**7.5**	10 U	0.16 J
Toluene	40	480	480	10 U	1 U	0.073 U	10 U	0.1 U	10 U	0.065 U	10 U	1 UJ	0.12 U	50 U	1 U	0.16 U	1 J	0.092 U
Vinyl chloride	1	2.6	2.6	10 U	1 U	0.13 U	10 U	0.13 U	10 U	0.13 U	10 U	1 UJ	0.13 U	**88**	**33**	**5.8**	10 U	0.13 U
Xylene (Total)	20	370	370	10 U	1 U	0.28 U	10 U	0.28 U	10 U	0.28 U	10 U	1 UJ	0.28 U	50 U	1 U	0.7 U	10 U	0.28 U

Notes:
All concentrations expressed in micrograms per kilogram
GCTL = groundwater cleanup target level (June 6, 2003)
FSWCTL = Freshwater surface water criteria (June 6, 2003)
MSWCTL = Marine surface water criteria (June 6, 2003)
* = GCTL, FSWCTL & MSWCTL for 1,3-dichloropropene (total)
GCTL exceedances in BOLD
J - present below the method detection limit but above the instrument detection limit
U - not detected
na - not analyzed

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	11GS05			11GS07		11GS09		11GS13			11GM28		11GM47		
				1993	1995	2003	1993	2003	1993	2003	1993	1995	2003	1993	2003	1993	1995	2003
Acetone	760	1700	1700	56 U	5 UJ	7.8 U	10 U	14 U	11 J	3.8 U	10 U	5 UR	90 U	10 U	25 U	10 U	70 J	8.7 U
Benzene	1	71.28	71.28	10 U	1 U	0.12 U	10 U	0.096 U	10 U	0.096 U	10 U	0.4 J	0.17 U	10 U	**3.2**	10 U	**3**	**11**
Bromodichloromethane	0.6	22	22	10 U	0.6 U	0.18 U	10 U	0.18 U	10 U	0.18 U	10 U	0.6 UJ	0.18 U	10 U	0.18 U	10 U	0.6 U	0.18 U
Bromoform	4.8	360	360	10 U	1 U	0.19 U	10 U	0.19 U	10 U	0.19 U	10 U	1 UJ	0.19 U	10 U	0.19 U	10 U	1 U	0.19 U
Bromomethane	11	35	35	10 U	1 U	0.49 U	10 U	0.49 U	10 U	0.49 U	10 U	1 UJ	0.49 U	10 U	0.49 U	10 U	1 UJ	0.49 U
2-Butanone (MEK)	4600	120000	120000	10 U	3 J	0.48 U	10 U	1.2 U	10 U	0.48 U	10 U	5 UJ	2.5 U	10 U	2 U	10 U	5 UJ	0.48 U
Carbon disulfide	760	110	110	10 U	1 U	0.72 U	10 U	0.72 U	10 U	0.72 U	10 U	1 UJ	0.72 U	10 U	0.72 U	10 U	1 U	0.72 U
Carbon tetrachloride	3	4.42	4.42	10 U	1 U	0.15 U	10 U	0.15 U	10 U	0.15 U	10 U	1 UJ	0.15 U	10 U	0.15 U	10 U	1 U	0.15 U
Chlorobenzene	100	17	17	10 U	1 U	0.1 U	10 U	0.1 U	10 U	0.1 U	10 U	1 UJ	0.1 U	10 U	0.1 U	10 U	1 U	0.1 U
Chloroethane	13	NA	NA	10 U	1 U	0.86 U	10 U	0.86 U	10 U	0.86 U	10 U	1 UJ	0.86 U	10 U	0.86 U	10 U	1 U	0.86 U
Chloroform	76	470.8	470.8	10 U	1 U	0.12 U	10 U	0.12 U	10 U	0.12 U	10 U	1 UJ	0.12 U	10 U	0.12 U	10 U	1 U	0.12 U
Chloromethane	2.9	470.8	470.8	10 U	1 U	0.4 U	10 U	0.4 U	10 U	0.4 U	10 U	1 UJ	0.4 U	10 U	0.4 U	10 U	1 U	0.4 U
Dibromochloromethane	0.5	34	34	10 U	1 U	0.078 U	10 U	0.078 U	10 U	0.078 U	10 U	1 UJ	0.078 U	10 U	0.078 U	10 U	1 U	0.078 U
1,1-Dichloroethane	76	NA	NA	10 U	1 U	0.12 U	10 U	0.12 U	10 U	0.12 U	10 U	22 J	0.12 U	10 U	0.12 U	10 U	1 U	0.12 U
1,2-Dichloroethane	3	40	40	10 U	1 U	0.18 U	10 U	0.18 U	10 U	0.18 U	10 U	1 UJ	0.18 U	10 U	0.18 U	10 U	1 U	0.18 U
1,1-Dichloroethene	7	3.2	3.2	10 U	1 U	0.31 U	10 U	0.31 U	10 U	0.31 U	10 U	2 J	0.31 U	10 U	0.31 U	10 U	1 U	0.31 U
cis-1,2-Dichloroethene	70	NA	NA	na	17	4.5	na	0.16 U	na	0.2 J	na	28 J	0.16 U	na	0.5 J	na	1 U	2.3
trans-1,2-Dichloroethene	100	11000	11000	na	1 U	0.36 U	na	0.36 U	na	0.36 U	na	0.6 J	0.36 U	na	0.36 U	na	1 U	0.36 U
1,2-Dichloroethene (total)	NA	7000	7000	6 J	na	na	10 U	na	10 U	na	4 J	na	na	10 U	na	9 J	na	na
1,2-Dichloropropane	5	16	16	10 U	1 U	0.17 U	10 U	0.17 U	10 U	0.17 U	10 U	1 UJ	0.17 U	10 U	0.17 U	10 U	1 U	0.17 U
cis-1,3-Dichloropropene	0.4*	12*	12*	10 U	1 U	0.12 U	10 U	0.12 U	10 U	0.12 U	10 U	1 UJ	0.12 U	10 U	0.12 U	10 U	1 U	0.12 U
trans-1,3-Dichloropropene	0.4*	12*	12*	10 U	1 U	0.15 U	10 U	0.15 U	10 U	0.15 U	10 U	1 UJ	0.15 U	10 U	0.15 U	10 U	1 U	0.15 U
Ethylbenzene	30	610	610	10 U	2	0.59 U	10 U	0.11 U	10 U	0.11 U	10 U	1 UJ	0.13 U	10 U	0.87 J	**58**	**70** D	**59**
2-Hexanone	300	NA	NA	10 U	5 U	0.29 U	10 U	0.29 U	10 U	0.29 U	10 U	5 UJ	0.29 U	10 U	0.29 U	10 U	5 U	0.29 U
Methylene chloride	5	1580	1580	10 U	2 U	0.61 U	10 U	0.61 U	10 U	0.61 U	10 U	2 UJ	0.61 U	10 U	0.61 U	10 U	2 U	0.61 U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	10 U	5 U	0.27 U	10 U	0.27 U	10 U	0.27 U	10 U	5 UJ	0.27 U	10 U	0.27 U	10 U	5 U	0.27 U
Styrene	100	460	460	10 U	1 U	0.3 U	10 U	0.18 U	10 U	0.076 U	10 U	1 UJ	0.05 U	10 U	0.17 U	10 U	1 U	0.5 U
Tetrachloroethene	3	8.85	8.85	2 J	1 U	0.43 U	10 U	0.43 U	10 U	0.43 U	10 U	**7** J	0.43 U	10 U	0.43 U	10 U	1 U	0.43 U
1,1,2,2-Tetrachloroethane	0.2	10.8	10.8	10 U	0.2 U	0.17 U	10 U	0.17 U	10 U	0.17 U	10 U	1 UJ	0.17 U	**2** J	0.17 U	10 U	0.2 U	0.17 U
1,1,1-Trichloroethane	200	270	270	10 U	1 U	0.065 U	10 U	0.065 U	10 U	0.065 U	10 U	1 UJ	0.065 U	10 U	0.065 U	10 U	1 U	0.065 U
1,1,2-Trichloroethane	5	17	17	10 U	1 U	0.11 U	10 U	0.11 U	10 U	0.11 U	10 U	1 UJ	0.11 U	10 U	0.11 U	10 U	1 U	0.11 U
Trichloroethene	3	80.7	80.7	**4** J	0.7 J	0.35 J	10 U	0.13 U	10 U	0.13 U	10 U	**5** J	0.13 U	10 U	0.13 U	10 U	1 U	0.2 J
Toluene	40	480	480	10 U	0.7 J	0.76 U	10 U	0.075 U	10 U	0.065 U	10 U	0.2 J	0.26 U	10 U	0.37 U	6 J	5	4.5
Vinyl chloride	1	2.6	2.6	10 U	1 U	0.13 U	10 U	0.13 U	10 U	0.37 J	10 U	**3** J	0.81 J	**2** J	0.88 J	**55**	**48** D	**12**
Xylene (Total)	20	370	370	10 U	**21**	4.8	10 U	0.28 U	10 U	0.28 U	10 U	1 UJ	0.34 U	1 J	0.67 U	**200**	**250** D	**170**

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	11GM52 1993	11GM52 1995	11GM52 2003	12GS01 1995	12GS01 2003	12GS06 1995	12GS06 2003	12GS08 1995	12GS08 2003	12GS10 1995	12GS10 2003	12GS17 2003	25GI01 1993	25GI01 1995	25GI01 2003
Acetone	760	1700	1700	50 UJ	11 UJ	18 U	5 UR	2.3 U	13 U	3.6 U	9 U	19 U	5 UR	5 U	3.6 U	10 U	5 U	2.3 U
Benzene	1	71.28	71.28	50 U	0.3 J	0.24 U	1 U	0.096 U	1 U	0.096 U	1 U	0.096 U	1 U	0.096 U	0.096 U	10 U	1 U	0.096 U
Bromodichloromethane	0.6	22	22	50 U	0.6 U	0.18 U	1 U	0.18 U	1 U	0.18 U	1 U	0.18 U	1 U	0.18 U	0.18 U	10 U	0.6 U	0.18 U
Bromoform	4.8	360	360	50 U	1 U	0.19 U	1 U	0.19 U	1 U	0.19 U	1 U	0.19 U	1 U	0.19 U	0.19 U	10 U	1 U	0.19 U
Bromomethane	11	35	35	50 U	1 UJ	0.49 U	1 U	0.49 U	1 U	0.49 U	1 U	0.49 U	1 U	0.49 U	0.49 U	10 U	1 U	0.49 U
2-Butanone (MEK)	4600	120000	120000	50 U	5 U	0.48 U	5 UR	0.9 U	5 UR	0.48 U	5 UR	1.6 U	5 UR	0.93 U	1.2 U	10 U	5 U	0.68 U
Carbon disulfide	760	110	110	50 U	1 U	0.72 U	1 U	0.72 U	1 U	0.72 U	1 U	0.72 U	1 U	0.72 U	0.72 U	10 U	1 U	0.72 U
Carbon tetrachloride	3	4.42	4.42	50 U	1 U	0.15 U	1 U	0.15 U	1 UJ	0.15 U	1 U	0.15 U	1 UJ	0.15 U	0.15 U	10 U	1 U	0.15 U
Chlorobenzene	100	17	17	50 U	1 U	0.1 U	1 U	0.1 U	1 U	0.1 U	1 U	0.1 U	1 U	0.1 U	0.1 U	10 U	1 U	0.1 U
Chloroethane	13	NA	NA	50 U	1 U	0.86 U	1 U	0.86 U	1 U	0.86 U	1 U	0.86 U	1 U	0.86 U	0.86 U	10 U	1 U	0.86 U
Chloroform	76	470.8	470.8	50 U	0.3 J	0.12 U	0.5 J	0.23 U	2	0.64 U	1 U	0.12 U	1 U	0.36 U	0.23 U	10 U	1 U	0.12 U
Chloromethane	2.9	470.8	470.8	50 U	1 UJ	0.4 U	1 U	0.4 U	1 U	0.4 U	1 U	0.4 U	1 U	0.4 U	0.4 U	10 U	1 U	0.4 U
Dibromochloromethane	0.5	34	34	50 U	1 U	0.078 U	1 U	0.078 U	1 U	0.078 U	1 U	0.078 U	1 U	0.078 U	0.078 U	10 U	1 U	0.078 U
1,1-Dichloroethane	76	NA	NA	9 J	72 D	2.2	1 U	0.12 U	1 U	0.12 U	1 U	0.12 U	12	0.2 J	0.22 J	10 U	1	0.84 J
1,2-Dichloroethane	3	40	40	50 U	1	0.18 U	1 U	0.18 U	1 U	0.18 U	1 U	0.18 U	1 U	0.18 U	0.18 U	10 U	1 U	0.18 U
1,1-Dichloroethene	7	3.2	3.2	50 U	**10**	2.4	1 U	0.31 U	1 U	0.31 U	1 U	0.31 U	0.8 J	0.31 U	0.31 U	10 U	0.4 J	0.31 U
cis-1,2-Dichloroethene	70	NA	NA	na	**970** D	**150** D	1 U	0.16 U	1 U	0.16 U	na	0.16 U	3	6.7	11	na	0.5 J	0.38 J
trans-1,2-Dichloroethene	100	11000	11000	na	4	1.6	1 U	0.36 U	1 U	0.36 U	1 U	0.36 U	1 U	0.36 U	0.36 U	na	1 U	0.36 U
1,2-Dichloroethene (total)	NA	7000	7000	420	na	na	na na	na	na	na	na	na	na	na	na	10 U	na	na
1,2-Dichloropropane	5	16	16	50 U	1 U	0.17 U	1 U	0.17 U	1 UJ	0.17 U	1 U	0.17 U	1 UJ	0.17 U	0.17 U	10 U	1 U	0.17 U
cis-1,3-Dichloropropene	0.4*	12*	12*	50 U	1 U	0.12 U	1 U	0.12 U	1 U	0.12 U	1 U	0.12 U	1 U	0.12 U	0.12 U	10 U	1 U	0.12 U
trans-1,3-Dichloropropene	0.4*	12*	12*	50 U	1 U	0.15 U	1 U	0.15 U	1 U	0.15 U	1 U	0.15 U	1 U	0.15 U	0.15 U	10 U	1 U	0.15 U
Ethylbenzene	30	610	610	50 U	1 U	0.14 U	1 U	0.11 U	1 U	0.11 U	1 U	0.11 U	1 U	0.11 U	5.7	10 U	1 U	0.11 U
2-Hexanone	300	NA	NA	50 U	5 U	0.29 U	5 U	0.29 U	5 UR	0.29 U	5 UR	0.29 U	5 UR	0.29 U	0.29 U	10 U	5 U	0.29 U
Methylene chloride	5	1580	1580	50 U	2 U	0.61 U	2 U	0.61 U	2 U	0.61 U	2 U	0.61 U	2 U	0.61 U	0.61 U	12 U	2 U	0.61 U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	50 U	5 U	0.29 U	5 U	0.27 U	5 UR	0.27 U	5 U	0.27 U	5 UR	0.27 U	0.27 U	10 U	5 U	0.27 U
Styrene	100	460	460	50 U	1 U	0.19 U	1 U	0.15 U	1 U	0.28 U	1 U	0.2 U	1 U	0.31 U	0.05 U	10 U	1 U	0.082 U
Tetrachloroethene	3	8.85	8.85	50 U	**23**	1.6	0.6 J	0.43 U	1	0.43 U	1 U	0.43 U	2	1.5	2.4	10 U	0.9 J	0.43 U
1,1,2,2-Tetrachloroethane	0.2	10.8	10.8	50 U	0.2 U	0.17 U	1 U	0.17 U	1 U	0.17 U	1 U	0.17 U	1 U	0.17 U	0.17 U	10 U	0.2 U	0.17 U
1,1,1-Trichloroethane	200	270	270	50 U	0.3 J	0.065 U	1 U	0.065 U	1 UJ	0.065 U	1 U	0.065 U	1 UJ	0.065 U	0.065 U	10 U	1 U	0.065 U
1,1,2-Trichloroethane	5	17	17	50 U	1 U	0.11 U	1 U	0.11 U	1 U	0.11 U	1 U	0.11 U	1 U	0.11 U	0.11 U	10 U	1 U	0.11 U
Trichloroethene	3	80.7	80.7	**20** J	**50**	**15**	1 U	0.14 J	1 UJ	0.13 U	1 UJ	0.13 U	0.6 J	0.28 J	0.35 J	**14**	**17**	**8.2**
Toluene	40	480	480	50 U	1 U	0.23 U	1 U	0.065 U	1 U	0.065 U	1 U	0.065 U	1 U	0.065 U	0.35 U	10 U	1 U	0.065 U
Vinyl chloride	1	2.6	2.6	**230**	**74** D	**2.4**	1 U	0.13 U	1 U	0.13 U	1 U	0.13 U	1 U	0.13 U	0.13 U	10 U	1 U	0.13 U
Xylene (Total)	20	370	370	50 U	1 U	0.28 U	1 U	0.28 U	1 U	0.28 U	1 U	0.28 U	1 U	0.28 U	0.28 U	10 U	1 U	0.28 U

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	25GI02			25GS04 (25GS10)	25GS10	27GI02			27GI04		27GI06		27GS02		
				1993	1995	2003	1993	2003	1993	1995	2003	1993	2003	1993	2003	1993	1995	2003
Acetone	760	1700	1700	10 U	22 UR	2.3 U	10 U	2.7 U	10 U	13 UR	4.7 U	10 U	2.3 U	10 U	8.8 U	10 U	5 UR	12 U
Benzene	1	71.28	71.28	10 U	1 U	0.096 U	10 U	0.096 U	**25**	1 U	0.17 U	10 U	0.096 U	10 U	0.096 U	10 U	1 U	0.096 U
Bromodichloromethane	0.6	22	22	10 U	0.6 U	0.18 U	10 U	0.18 U	10 U	0.6 U	0.18 U	10 U	0.18 U	10 U	0.18 U	10 U	0.6 U	0.18 U
Bromoform	4.8	360	360	10 U	1 U	0.19 U	10 U	0.19 U	10 U	1 U	0.19 U	10 U	0.19 U	10 U	0.19 U	10 U	1 U	0.19 U
Bromomethane	11	35	35	10 U	1 UJ	0.49 U	10 U	0.49 U	10 U	1 UJ	0.49 U	10 U	0.49 U	10 U	0.49 U	10 U	1 U	0.49 U
2-Butanone (MEK)	4600	120000	120000	10 U	5 U	0.48 U	10 U	0.83 U	10 U	5 U	0.48 U	10 U	0.6 U	10 U	0.48 U	10 U	5 UR	0.99 U
Carbon disulfide	760	110	110	10 U	1 U	0.72 U	10 U	0.72 U	10 U	1 U	0.72 U	10 U	0.72 U	10 U	0.72 U	10 U	1 U	0.72 U
Carbon tetrachloride	3	4.42	4.42	10 U	1 U	0.15 U	10 U	0.15 U	10 U	1 U	0.15 U	10 U	0.15 U	10 U	0.15 U	10 U	1 U	0.15 U
Chlorobenzene	100	17	17	10 U	1 U	2.1	10 U	0.1 U	95	1 U	0.1 U	10 U	0.1 U	10 U	0.1 U	10 U	1 U	0.1 U
Chloroethane	13	NA	NA	10 U	1 U	0.86 U	**44**	0.86 U	10 U	1 U	0.86 U	10 U	0.86 U	10 U	0.86 U	10 U	1 U	0.86 U
Chloroform	76	470.8	470.8	1 J	1 U	0.12 U	10 U	0.12 U	10 U	1 U	0.12 U	1 J	0.12 U	10 U	0.12 U	10 U	1 U	0.16 U
Chloromethane	2.9	470.8	470.8	10 U	1 U	0.4 U	10 U	0.4 U	10 U	1 UJ	0.4 U	10 U	0.4 U	10 U	0.4 U	10 U	1 U	0.4 U
Dibromochloromethane	0.5	34	34	10 U	1 U	0.078 U	10 U	0.078 U	10 U	1 U	0.078 U	10 U	0.078 U	10 U	0.078 U	10 U	1 U	0.078 U
1,1-Dichloroethane	76	NA	NA	10 U	1	6.8	**90**	1.3	3 J	1 U	0.12 U	8 J	5.7	10 U	4.3	10 U	1 U	0.12 U
1,2-Dichloroethane	3	40	40	10 U	1 U	0.18 U	10 U	0.18 U	10 U	1 U	0.18 U	10 U	0.18 U	10 U	0.18 U	10 U	1 U	0.18 U
1,1-Dichloroethene	7	3.2	3.2	1 J	0.6 J	0.51 J	3 J	0.31 U	10 U	1 U	0.31 U	**14**	**18**	10 U	**16**	10 U	1 U	0.31 U
cis-1,2-Dichloroethene	70	NA	NA	na	0.2 J	0.16 U	na	3.8	na	1 U	0.16 U	na	4.1	na	0.16 U	na	1 U	0.16 U
trans-1,2-Dichloroethene	100	11000	11000	na	1 U	0.36 U	na	0.36 U	na	1 U	0.36 U	na	0.36 U	na	0.36 U	na	1 U	0.36 U
1,2-Dichloroethene (total)	NA	7000	7000	10 U	na	na	10 U	na	2 J	na	na	10 U	na	10 U	na	10 U	na	na
1,2-Dichloropropane	5	16	16	10 U	1 U	0.17 U	10 U	0.17 U	10 U	1 U	0.17 U	10 U	0.17 U	10 U	0.17 U	10 U	1 U	0.17 U
cis-1,3-Dichloropropene	0.4*	12*	12*	10 U	1 U	0.12 U	10 U	0.12 U	10 U	1 U	0.12 U	10 U	0.12 U	10 U	0.12 U	10 U	1 U	0.12 U
trans-1,3-Dichloropropene	0.4*	12*	12*	10 U	1 U	0.15 U	10 U	0.15 U	10 U	1 U	0.15 U	10 U	0.15 U	10 U	0.15 U	10 U	1 U	0.15 U
Ethylbenzene	30	610	610	10 U	1 U	0.11 U	2 J	4.8	4 J	1 U	0.11 U	10 U	0.11 U	10 U	0.11 U	10 U	1 U	0.11 U
2-Hexanone	300	NA	NA	10 U	5 U	0.29 U	10 U	0.29 U	10 U	5 U	0.29 U	10 U	0.29 U	10 U	0.29 U	10 U	5 U	0.29 U
Methylene chloride	5	1580	1580	10 U	2 U	0.61 U	10 U	0.61 U	10 U	2 U	0.61 U	10 U	0.61 U	10 U	0.61 U	10 U	2 U	0.61 U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	10 U	5 U	0.27 U	10 U	0.27 U	10 U	5 U	0.27 U	10 U	0.27 U	10 U	0.27 U	10 U	5 U	0.27 U
Styrene	100	460	460	10 U	1 U	0.052 U	10 U	0.05 U	10 U	1 U	0.05 U	10 U	0.11 U	10 U	0.088 U	10 U	1 U	0.26 U
Tetrachloroethene	3	8.85	8.85	1 J	2	0.43 U	10 U	0.43 U	10 U	1 U	0.43 U	10 U	2	10 U	0.63 J	10 U	0.4 J	0.43 U
1,1,2,2-Tetrachloroethane	0.2	10.8	10.8	10 U	0.2 U	0.17 U	10 U	0.17 U	10 U	0.2 U	0.17 U	10 U	0.17 U	10 U	0.17 U	10 U	0.2 U	0.17 U
1,1,1-Trichloroethane	200	270	270	2 J	0.6 J	0.065 U	10	0.065 U	10 U	1 U	0.1 J	12	0.3 J	10 U	0.065 U	5 J	2	0.2 J
1,1,2-Trichloroethane	5	17	17	10 U	1 U	0.11 U	10 U	0.11 U	10 U	1 U	0.11 U	10 U	0.11 U	10 U	0.11 U	10 U	1 U	0.11 U
Trichloroethene	3	80.7	80.7	**5** J	**10**	1.4	10 U	0.13 U	10 U	1 U	0.13 U	10 U	1.2	10 U	0.73 J	**3** J	**3**	1.7
Toluene	40	480	480	10 U	1 U	0.065 U	10 U	0.32 U	10 U	1 U	0.065 U	10 U	0.065 U	10 U	0.065 U	10 U	1 U	0.22 U
Vinyl chloride	1	2.6	2.6	10 U	1 U	0.13 U	**7** J	0.13 U	**4** J	1 U	0.13 U	10 U	0.13 U	10 U	0.13 U	10 U	1 U	0.13 U
Xylene (Total)	20	370	370	10 U	1 U	0.28 U	5 J	18	**34**	1 U	0.28 U	10 U	0.28 U	10 U	0.28 U	10 U	1 U	0.28 U

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	27GS04			27GS05		27GS10			27GS11			27GS17	27GS18	
				1993	1995	2003	1993	2003	1993	1995	2003	1993	1995	2003	2003	1993	2003
Acetone	760	1700	1700	10 U	5 U	19 U	10 U	2.3 U	10 U	5 U	2.3 U	17 U	5 UR	2.3 U	2.3 U	100 U	18 U
Benzene	1	71.28	71.28	10 U	1 U	**3.1**	10 U	0.096 U	10 U	1 U	0.096 U	17 U	1 UR	0.096 U	0.096 U	100 U	0.096 U
Bromodichloromethane	0.6	22	22	10 U	0.6 U	0.18 U	10 U	0.18 U	10 U	0.6 U	0.18 U	17 U	0.6 UR	0.18 U	0.18 U	100 U	0.18 U
Bromoform	4.8	360	360	10 U	1 U	0.19 U	10 U	0.19 U	10 U	1 U	0.19 U	17 U	1 UR	0.19 U	0.19 U	100 U	0.19 U
Bromomethane	11	35	35	10 U	1 UJ	0.49 U	10 U	0.49 U	10 U	1 UJ	0.49 U	17 U	1 UR	0.49 U	0.49 U	100 U	0.49 U
2-Butanone (MEK)	4600	120000	120000	10 U	5 U	0.48 U	10 U	0.58 U	10 U	5 U	0.86 U	17 U	5 UR	1.9 U	0.88 U	100 U	2.6 U
Carbon disulfide	760	110	110	10 U	1 U	0.72 U	10 U	0.72 U	10 U	1 U	0.72 U	17 U	1 UR	0.72 U	0.72 U	100 U	0.72 U
Carbon tetrachloride	3	4.42	4.42	10 U	1 U	0.15 U	10 U	0.15 U	10 U	1 U	0.15 U	17 U	1 UR	0.15 U	0.15 U	100 U	0.15 U
Chlorobenzene	100	17	17	10 U	1 U	0.1 U	10 U	0.1 U	10 U	1 U	1	17 U	1 UR	0.1 U	0.1 U	100 U	0.1 U
Chloroethane	13	NA	NA	10 U	3	0.86 U	10 U	0.86 U	10 U	**22**	0.86 U	**84**	7 J	**13**	0.86 U	**33** J	4.6
Chloroform	76	470.8	470.8	10 U	1 U	0.12 U	1 U	0.77 J	10 U	0.4 J	0.12 U	4 J	4 J	0.12 U	0.12 U	100 U	0.12 U
Chloromethane	2.9	470.8	470.8	10 U	1 U	0.4 U	10 U	0.4 U	10 U	1 U	0.4 U	17 U	1 UR	0.4 U	0.4 U	100 U	0.4 U
Dibromochloromethane	0.5	34	34	10 U	1 U	0.078 U	10 U	0.078 U	10 U	1 U	0.078 U	17 U	1 UR	0.078 U	0.078 U	100 U	0.078 U
1,1-Dichloroethane	76	NA	NA	17	7	0.13 J	7 J	0.55 J	7 J	260 D	1.9	**300**	**120** D	35	4.9	20 J	4.5
1,2-Dichloroethane	3	40	40	10 U	1 U	0.18 U	10 U	0.18 U	10 U	37 D	0.18 U	17 U	1 UR	0.18 U	0.18 U	100 U	0.18 U
1,1-Dichloroethene	7	3.2	3.2	**51**	1 U	0.31 U	3 J	0.31 U	**10**	**110** D	2.2	**26**	**12** J	1.2	0.31 U	100 U	0.31 U
cis-1,2-Dichloroethene	70	NA	NA	na	2	4.6	na	0.16 U	na	15	4.4	na	5 J	1.6	0.83 J	na	2.9
trans-1,2-Dichloroethene	100	11000	11000	na	1 U	0.36 U	na	0.36 U	na	1 U	0.36 U	na	1 UR	0.36 U	0.36 U	na	0.36 U
1,2-Dichloroethene (total)	NA	7000	7000	1 J	na	na	10 U	na	10 U	na	na	17 U	na	na	na	24 J	na
1,2-Dichloropropane	5	16	16	10 U	1 U	0.17 U	10 U	0.17 U	10 U	1 U	0.17 U	17 U	1 UR	0.17 U	0.17 U	100 U	0.17 U
cis-1,3-Dichloropropene	0.4*	12*	12*	10 U	1 U	0.12 U	10 U	0.12 U	10 U	1 U	0.12 U	17 U	1 UR	0.12 U	0.12 U	100 U	0.12 U
trans-1,3-Dichloropropene	0.4*	12*	12*	10 U	1 U	0.15 U	10 U	0.15 U	10 U	1 U	0.15 U	17 U	1 UR	0.15 U	0.15 U	100 U	0.15 U
Ethylbenzene	30	610	610	10 U	1 U	0.11 U	10 U	0.11 U	10 U	1 U	0.11 U	17 U	1 UR	0.11 U	0.11 U	**42** J	11
2-Hexanone	300	NA	NA	10 U	5 U	0.29 U	10 U	0.29 U	10 U	5 U	0.29 U	17 U	5 UR	0.29 U	0.29 U	100 U	0.29 U
Methylene chloride	5	1580	1580	10 U	2 U	0.61 U	10 U	0.61 U	17 U	2 U	0.61 U	17 U	2 UR	0.61 U	0.61 U	100 U	0.61 U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	10 U	5 U	0.27 U	10 U	0.27 U	10 U	5 U	0.27 U	17 U	5 UR	0.27 U	0.27 U	100 U	0.27 U
Styrene	100	460	460	10 U	1 U	0.14 U	10 U	0.05 U	10 U	1 U	0.05 U	17 U	1 UR	0.078 U	0.05 U	100 U	0.05 U
Tetrachloroethene	3	8.85	8.85	10 U	1	1.1	10 U	0.43 U	10 U	**9**	0.9 J	**4** J	2 J	1.7	0.86 J	**62** J	**10**
1,1,2,2-Tetrachloroethane	0.2	10.8	10.8	10 U	0.2 U	0.17 U	10 U	0.17 U	10 U	0.2 U	0.17 U	17 U	0.2 UR	0.17 U	0.17 U	100 U	0.17 U
1,1,1-Trichloroethane	200	270	270	55	1 U	0.065 U	8 J	0.25 J	160	320 D	0.065 U	**300**	51 J	10	0.065 U	100 U	0.065 U
1,1,2-Trichloroethane	5	17	17	10 U	1 U	0.11 U	10 U	0.11 U	10 U	1 U	0.11 U	17 U	1 UR	0.11 U	0.11 U	100 U	0.11 U
Trichloroethene	3	80.7	80.7	**3** J	**7**	**3.3**	10 U	0.13 U	1 J	1	0.56 J	17 U	1 UR	0.2 J	0.13 U	100 U	1.1
Toluene	40	480	480	10 U	0.1 J	0.22 U	10 U	0.065 U	10 U	1 U	0.065 U	17 U	1 UR	0.065 U	0.065 U	100 U	0.42 U
Vinyl chloride	1	2.6	2.6	10 U	1 U	0.13 U	10 U	0.13 U	10 U	1 U	0.13 U	17 U	1 UR	0.13 U	0.13 U	100 U	0.13 U
Xylene (Total)	20	370	370	10 U	1 U	0.28 U	10 U	0.28 U	10 U	1 U	0.28 U	17 U	1 UR	0.42 U	0.28 U	**480**	**78**

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	27GS19						27GS21					
				1993		1995		2003		1993		1995		2003	
Acetone	760	1700	1700	100	U	4	J	2.3	U	10	U	5	U	2.3	U
Benzene	1	71.28	71.28	100	U	1	U	0.096	U	10	U	1	U	0.096	u
Bromodichloromethane	0.6	22	22	100	U	0.6	U	0.18	U	10	U	0.6	U	0.18	U
Bromoform	4.8	360	360	100	U	1	U	0.19	U	10	U	1	U	0.19	U
Bromomethane	11	35	35	100	U	1	U	0.49	U	10	U	1	U	0.49	U
2-Butanone (MEK)	4600	120000	120000	100	U	5	UJ	6.1	U	10	U	5	U	0.61	U
Carbon disulfide	760	110	110	100	U	1	U	0.72	U	10	U	1	U	0.72	U
Carbon tetrachloride	3	4.42	4.42	100	U	1	U	0.15	U	10	U	1	U	0.15	U
Chlorobenzene	100	17	17	100	U	1	U	0.1	U	10	U	1	U	0.1	U
Chloroethane	13	NA	NA	**96**	J	2		0.86	U	**190**		8		0.86	U
Chloroform	76	470.8	470.8	100	U	1	U	0.16	U	10	U	1	U	0.12	U
Chloromethane	2.9	470.8	470.8	100	U	1	U	0.4	U	10	U	1	U	0.4	U
Dibromochloromethane	0.5	34	34	100	U	1	U	0.078	U	10	U	1	U	0.078	U
1,1-Dichloroethane	76	NA	NA	72	J	3		1.4		45		17		3.1	
1,2-Dichloroethane	3	40	40	100	U	1	U	0.18	U	10	U	1	U	0.18	U
1,1-Dichloroethene	7	3.2	3.2	100	U	1	U	1.2		**15**		1	U	0.31	U
cis-1,2-Dichloroethene	70	NA	NA	na		**25**	D	**300**	D	na		1	U	0.36	J
trans-1,2-Dichloroethene	100	11000	11000	na		1	U	0.36	U	na		1	U	0.36	U
1,2-Dichloroethene (total)	NA	7000	7000	130		na		na		10	U	na		na	
1,2-Dichloropropane	5	16	16	100	U	1	U	0.17	U	10	U	1	U	0.17	U
cis-1,3-Dichloropropene	0.4*	12*	12*	100	U	1	U	0.12	U	10	U	1	U	0.12	U
trans-1,3-Dichloropropene	0.4*	12*	12*	100	U	1	U	0.15	U	10	U	1	U	0.15	U
Ethylbenzene	30	610	610	**63**	J	10		**61**		3	J	1	U	0.11	U
2-Hexanone	300	NA	NA	100	U	5	U	0.29	U	10	U	5	U	0.29	U
Methylene chloride	5	1580	1580	10	U	2	U	0.61	U	21	U	2	U	0.61	U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	100	U	5	U	0.27	U	10	U	5	U	0.27	U
Styrene	100	460	460	100	U	1	U	0.05	U	10	U	1	U	0.05	U
Tetrachloroethene	3	8.85	8.85	**61**	J	**32**	D	**65**		**3**	J	2		0.58	J
1,1,2,2-Tetrachloroethane	0.2	10.8	10.8	100	U	0.2	U	0.17	U	10	U	0.2	U	0.17	U
1,1,1-Trichloroethane	200	270	270	100	U	1	U	0.065	U	1	J	1	U	0.1	J
1,1,2-Trichloroethane	5	17	17	100	U	1	U	0.11	U	10	U	1	U	0.11	U
Trichloroethene	3	80.7	80.7	**130**		**17**		**3.6**		10	U	1	U	0.13	U
Toluene	40	480	480	**53**	J	5		2.2		4	J	1	U	0.065	U
Vinyl chloride	1	2.6	2.6	100	U	1	U	0.61	J	10	U	1	U	0.13	U
Xylene (Total)	20	370	370	**640**		**79**	D	**530**		**50**		1	U	0.28	U

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	30GI19				30GI111						30GI113				30GI126				30GI164				30GI170			
				1993		2003		1993		1995		2003		1993		2003		1993		2003		1993		2003		1993		2003	
Acetone	760	1700	1700	10	U	5.5	U	5	U	1	J	5.8	U	10	UJ	4.2	U	8	J	6.5	U	100	U	2.3	U	10	U	2.3	U
Benzene	1	71.28	71.28	10	U	0.41	U	**7**		2	J	**2.8**		10	U	0.13	U	10	U	0.21	U	100	U	0.096	U	10	U	0.096	U
Bromodichloromethane	0.6	22	22	10	U	0.18	U	0.6	U	10	U	0.36	U	10	U	0.18	U	10	U	0.18	U	100	U	0.18	U	10	U	0.18	U
Bromoform	4.8	360	360	10	U	0.19	U	1	U	10	U	0.38	U	10	U	0.19	U	10	U	0.19	U	100	U	0.19	U	10	U	0.19	U
Bromomethane	11	35	35	10	U	0.49	U	1	U	10	U	0.98	U	10	U	0.49	U	10	U	0.49	U	100	U	0.49	U	10	U	0.49	U
2-Butanone (MEK)	4600	120000	120000	10	U	0.95	U	5	UJ	10	U	1.1	U	10	UJ	1.3	U	10	UJ	0.68	U	100	U	0.48	U	10	U	0.48	U
Carbon disulfide	760	110	110	10	U	0.72	U	1	U	10	U	1.4	U	10	U	0.72	U	10	U	0.72	U	100	U	0.72	U	10	U	0.72	U
Carbon tetrachloride	3	4.42	4.42	10	U	0.15	U	1	U	10	U	0.3	U	10	U	0.15	U	10	U	0.15	U	100	U	0.15	U	10	U	0.15	U
Chlorobenzene	100	17	17	10	U	0.1	U	**830**	UD	**620**	D	**450**	D	10	U	0.1	U	1	J	0.1	U	100	U	0.1	U	10	U	0.8	J
Chloroethane	13	NA	NA	10	U	0.86	U	1	U	5	J	1.7	U	10	U	0.86	U	10	U	0.86	U	100	U	0.86	U	10	U	0.86	U
Chloroform	76	470.8	470.8	10	U	0.12	U	1	U	10	U	0.24	U	10	U	0.12	U	10	U	0.12	U	100	U	1.9		10	U	0.12	U
Chloromethane	2.9	470.8	470.8	10	U	0.4	U	1	U	10	U	0.8	U	10	U	0.4	U	10	U	0.4	U	na		0.4	U	10	U	0.49	U
Dibromochloromethane	0.5	34	34	10	U	0.078	U	1	U	10	U	0.16	U	10	U	0.078	U	10	U	0.078	U	100	U	0.078	U	10	U	0.078	U
1,1-Dichloroethane	76	NA	NA	10	U	0.12	U	5		4	J	0.24	U	10	U	0.12	U	10	U	0.12	U	**320**		13		1	J	0.25	J
1,2-Dichloroethane	3	40	40	10	U	0.18	U	1	U	10	U	0.36	U	10	U	0.18	U	10	U	0.18	U	100	U	0.18	U	10	U	0.18	U
1,1-Dichloroethene	7	3.2	3.2	10	U	0.31	U	1	U	10	U	0.62	U	10	U	0.31	U	10	U	0.31	U	**410**		2.8		10	U	0.65	J
cis-1,2-Dichloroethene	70	NA	NA	na		0.16	U	1	U	na		0.32	U	na		0.16	U	na		0.16	U	100	U	12		na		**100**	
trans-1,2-Dichloroethene	100	11000	11000	na		0.36	U	1	U	na		0.72	U	na		0.36	U	na		0.36	U	na		0.36	U	na		3.1	
1,2-Dichloroethene (total)	NA	7000	7000	10	U	na		na		10	U	na		10	U	na		10	U	na		100	U	na		3	J	na	
1,2-Dichloropropane	5	16	16	10	U	0.17	U	1	U	10	U	0.34	U	10	U	0.17	U	10	U	0.17	U	100	U	0.17	U	10	U	0.17	U
cis-1,3-Dichloropropene	0.4	12*	12*	10	U	0.12	U	1	U	10	U	0.24	U	10	U	0.12	U	10	U	0.12	U	100	U	0.12	U	10	U	0.12	U
trans-1,3-Dichloropropene	0.4	12*	12*	10	U	0.15	U	1	U	10	U	0.3	U	10	U	0.15	U	10	U	0.15	U	100	U	0.15	U	10	U	0.15	U
Ethylbenzene	30	610	610	10	U	0.74	J	1	U	1	J	0.22	U	10	U	0.11	U	10	U	0.11	U	100	U	0.11	U	10	U	0.11	U
2-Hexanone	300	NA	NA	10	U	0.29	U	5	U	10	U	0.58	U	10	UJ	0.29	U	10	UJ	0.29	U	100	U	0.29	U	10	U	0.29	U
Methylene chloride	5	1580	1580	10	U	0.61	U	2	U	10	U	1.2	U	10	U	0.61	U	2	J	0.61	U	**11**	J	0.61	U	10	U	0.61	U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	10	U	0.27	U	5	U	10	U	0.54	U	10	UJ	0.27	U	10	UJ	0.27	U	100	U	0.27	U	10	U	0.27	U
Styrene	100	460	460	10	U	0.05	U	1	U	10	U	0.1	U	10	U	0.33	U	10	U	0.05	U	100	U	0.15	U	10	U	0.19	U
Tetrachloroethene	3	8.85	8.85	10	U	0.43	U	0.4	J	10	U	0.86	U	10	U	0.43	U	10	U	0.43	U	100	U	1.4		**3**	J	0.98	J
1,1,2,2-Tetrachloroethane	0.2	10.8	NA	10	U	0.17	U	0.2	U	10	U	0.34	U	10	UJ	0.17	U	10	UJ	0.17	U	100	U	0.17	U	10	U	0.17	U
1,1,1-Trichloroethane	200	270	270	10	U	0.065	U	1	U	10	U	0.13	U	10	U	0.065	U	10	U	0.065	U	**950**		0.065	U	2	J	0.065	U
1,1,2-Trichloroethane	5	17	17	10	U	0.11	U	1	U	10	U	0.22	U	10	U	0.11	U	10	U	0.11	U	100	U	0.11	U	10	U	0.11	U
Trichloroethene	3	80.7	80.7	**22**		0.13	U	1	U	10	U	1.5	J	10	U	0.22	U	10	U	0.13	U	100	U	0.34	J	**34**		**310**	D
Toluene	40	480	480	10	U	0.065	U	1		1	J	0.42	U	10	U	0.16	U	1	J	0.065	U	100	U	0.065	U	10	U	0.1	U
Vinyl chloride	1	2.6	2.6	10	U	0.13	U	**15**		**20**		**7.9**		10	U	0.13	U	10	U	0.13	U	100	U	0.13	U	10	U	**3.8**	
Xylene (Total)	20	370	370	10	U	0.28	U	1	U	6	J	0.56	U	10	U	0.28	U	3	J	0.28	U	100	U	0.28	U	10	U	0.28	U

Notes:

All concentrations expressed in micrograms per kilogram

GCTL = groundwater cleanup target level (June 6, 2003)

FSWCTL = Freshwater surface water criteria (June 6, 2003)

MSWCTL = Marine surface water criteria (June 6, 2003)

* = GCTL, FSWCTL & MSWCTL for 1,3-dichloropropene (total)

GCTL exceedances in BOLD

J - present below the method detection limit but above the instrument detection limit

U - not detected

na - not analyzed

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	30GI32A						30GS03				30GS05				30GS06						30GS11			
				1993		1995		2003		1993		2003		1993		2003		1993		1995		2003		1993		2003	
Acetone	760	1700	1700	100	U	5	UR	7.1	U	10	UJ	2.7	U	10	U	6.3	U	100	U	5	U	12	U	10	U	11	U
Benzene	1	71.28	71.28	100	U	1	U	0.15	U	10	U	0.096	U	10	U	0.096	U	**250**		2		**2.6**	J	10	U	0.22	U
Bromodichloromethane	0.6	22	22	100	U	0.6	U	0.18	U	10	U	0.18	U	10	U	0.18	U	100	U	0.6	U	0.9	U	10	U	0.18	U
Bromoform	4.8	360	360	100	U	1	U	0.19	U	10	U	0.19	U	10	U	0.19	U	100	U	1	U	0.95	U	10	U	0.19	U
Bromomethane	11	35	35	100	U	1	U	0.49	U	10	U	0.49	U	10	U	0.49	U	100	U	1	U	2.4	U	10	U	0.49	U
2-Butanone (MEK)	4600	120000	120000	70	J	5	UR	1.6	U	10	U	0.71	U	10	U	0.66	U	80	J	5	UJ	2.4	U	10	U	0.48	U
Carbon disulfide	760	110	110	100	U	1	U	0.72	U	10	U	0.72	U	10	U	0.72	U	100	U	1	U	3.6	U	10	U	0.72	U
Carbon tetrachloride	3	4.42	4.42	100	U	1	U	0.15	U	10	U	0.15	U	10	U	0.15	U	100	U	1	U	0.75	U	10	U	0.15	U
Chlorobenzene	100	17	17	100	U	1	U	0.1	U	10	U	0.1	U	10	U	0.1	U	100	U	1	U	0.5	U	10	U	0.1	U
Chloroethane	13	NA	NA	100	U	1	U	0.86	U	10	U	0.86	U	10	U	0.86	U	100	U	1	U	4.3	U	10	U	0.86	U
Chloroform	76	470.8	470.8	100	U	0.3	J	0.16	U	10	U	2.1		10	U	0.34	U	100	U	1	U	0.6	U	10	U	0.22	U
Chloromethane	2.9	470.8	470.8	100	U	1	U	0.4	U	10	U	0.4	U	10	U	0.4	U	100	U	1	U	2	U	10	U	0.4	U
Dibromochloromethane	0.5	34	34	100	U	1	U	0.078	U	10	U	0.078	U	10	U	0.078	U	100	U	1	U	0.39	U	10	U	0.078	U
1,1-Dichloroethane	76	NA	NA	60	J	9	J	0.12	U	2	J	1.2		10	U	0.12	U	15	J	1	U	0.6	U	1	J	0.12	U
1,2-Dichloroethane	3	40	40	100	U	1	U	0.18	U	10	U	0.18	U	10	U	0.18	U	100	U	1	U	0.9	U	10	U	0.18	U
1,1-Dichloroethene	7	3.2	3.2	**14**	J	0.8	J	0.35	J	1	J	0.31	U	10	U	0.31	U	100	U	1	U	1.6	U	10	U	0.31	U
cis-1,2-Dichloroethene	70	NA	NA	na		1		0.16	U	na		0.16	U	na		0.38	J	na		2	J	0.8	U	na		0.16	U
trans-1,2-Dichloroethene	100	11000	11000	na		1	U	0.36	U	na		0.36	U	na		0.36	U	na		1	U	1.8	U	na		0.36	U
1,2-Dichloroethene (total)	NA	7000	7000	100	U	na		na		10	U	na		10	U	na		18	J	na		na		10	U	na	
1,2-Dichloropropane	5	16	16	100	U	1	U	0.17	U	10	U	0.17	U	10	U	0.17	U	100	U	1	U	0.85	U	10	U	0.17	U
cis-1,3-Dichloropropene	0.4	12*	12*	100	U	1	U	0.12	U	10	U	0.12	U	10	U	0.12	U	100	U	1	U	0.6	U	10	U	0.12	U
trans-1,3-Dichloropropene	0.4	12*	12*	100	U	1	U	0.15	U	10	U	0.15	U	10	U	0.15	U	100	U	1	U	0.75	U	10	U	0.15	U
Ethylbenzene	30	610	610	100	U	1	U	0.11	U	10	U	0.11	U	10	U	0.17	J	**380**		9		**810**		1	J	0.67	J
2-Hexanone	300	NA	NA	100	U	5	U	0.29	U	10	U	0.29	U	10	U	0.29	U	100	U	5	U	1.4	U	10	U	0.29	U
Methylene chloride	5	1580	1580	100	U	2	U	0.61	U	10	U	0.61	U	10	U	0.61	U	**12**	J	2	U	3	U	10	U	0.61	U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	100	U	5	U	0.27	U	10	U	0.27	U	10	U	0.27	U	100	U	5	U	1.4	U	10	U	0.27	U
Styrene	100	460	460	100	U	1	U	0.16	U	10	U	0.05	U	10	U	0.05	U	100	U	1	U	1.8	U	10	U	0.05	U
Tetrachloroethene	3	8.85	8.85	100	U	1	U	0.43	U	**7**	J	0.43	U	10	U	0.43	U	100	U	2		2.2	U	10	U	0.43	U
1,1,2,2-Tetrachloroethane	0.2	10.8	NA	100	U	0.2	U	0.17	U	10	U	0.17	U	10	U	0.17	U	100	U	0.2	U	0.85	U	10	U	0.17	U
1,1,1-Trichloroethane	200	270	270	**300**		16	J	0.065	U	14		0.065	U	10	U	0.065	U	13	J	1		0.32	U	10	U	0.065	U
1,1,2-Trichloroethane	5	17	17	100	U	1	U	0.11	U	10	U	0.11	U	10	U	0.11	U	100	U	1	U	0.55	U	10	U	0.11	U
Trichloroethene	3	80.7	80.7	100	U	1	U	0.13	U	10	U	0.13	U	10	U	0.13	U	100	U	0.2	J	0.65	U	10	U	0.13	U
Toluene	40	480	480	100	U	1	U	0.15	U	10	U	0.065	U	10	U	0.065	U	**140**		0.6	J	16		10	U	0.065	U
Vinyl chloride	1	2.6	2.6	100	U	1	U	0.13	U	10	U	0.13	U	10	U	0.13	U	100	U	1	U	0.65	U	10	U	0.13	U
Xylene (Total)	20	370	370	100	U	1	U	0.28	U	10	U	0.28	U	10	U	0.28	U	**1200**		9	J	**500**		3	J	1.1	J

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	30GS15				30GS18						30GS20						30GS22					
				1993		2003		1993		1995		2003		1993		1995		2003		1993		1995		2003	
Acetone	760	1700	1700	10	U	6.2	U	10	U	5	UR	3.6	U	10	U	5	UR	2.3	U	50	U	5	U	30	U
Benzene	1	71.28	71.28	10	U	0.11	U	10	U	1	U	0.5	J	10	U	1	U	0.096	U	50	U	1	U	0.16	U
Bromodichloromethane	0.6	22	22	10	U	0.18	U	10	U	0.6	U	0.18	U	10	U	0.6	U	0.18	U	50	U	0.6	U	0.18	U
Bromoform	4.8	360	360	10	U	0.19	U	10	U	1	U	0.19	U	10	U	1	U	0.19	U	50	U	1	U	0.19	U
Bromomethane	11	35	35	10	U	0.49	U	10	U	1	U	0.49	U	10	U	1	U	0.49	U	50	U	1	U	0.49	U
2-Butanone (MEK)	4600	120000	120000	10	U	2	U	10	U	5	UR	0.48	U	10	U	5	UR	0.53	U	50	U	5	UJ	12	U
Carbon disulfide	760	110	110	10	U	0.72	U	10	U	1	U	0.72	U	10	U	1	U	0.72	U	50	UJ	1	U	0.72	U
Carbon tetrachloride	3	4.42	4.42	10	U	0.15	U	10	U	1	U	0.15	U	10	U	1	U	0.15	U	50	U	1	U	0.15	U
Chlorobenzene	100	17	17	10	U	0.1	U	10	U	1	U	0.1	U	10	U	1	U	0.1	U	50	U	1	U	0.1	U
Chloroethane	13	NA	NA	10	U	0.86	U	10	U	1	U	0.86	U	10	U	1	U	0.86	U	50	U	**110**	D	**22**	
Chloroform	76	470.8	470.8	10	U	0.19	U	10	U	1	U	0.78	U	3	J	1	U	0.12	U	50	U	5		0.29	U
Chloromethane	2.9	470.8	470.8	10	U	0.73	U	1	J	1	U	0.4	U	10	U	1	U	0.4	U	50	UJ	1	U	0.4	U
Dibromochloromethane	0.5	34	34	10	U	0.078	U	10	U	1	U	0.078	U	10	U	1	U	0.078	U	50	U	1	U	0.078	U
1,1-Dichloroethane	76	NA	NA	10	U	0.12	U	10	U	1	U	0.12	J	10	U	1	U	0.12	U	**900**	D	**1400**	D	**180**	
1,2-Dichloroethane	3	40	40	10	U	0.18	U	10	U	1	U	0.18	U	10	U	1	U	0.18	U	50	U	1	U	0.29	J
1,1-Dichloroethene	7	3.2	3.2	10	U	0.31	U	10	U	1	U	0.31	U	10	U	1	U	0.31	U	**170**		**68**	D	2	
cis-1,2-Dichloroethene	70	NA	NA	na		0.16	U	na		1	U	7.9		na		1	U	0.72	J	na		7		16	
trans-1,2-Dichloroethene	100	11000	11000	na		0.36	U	na		1	U	0.36	U	na		1	U	0.36	U	na		1	U	0.36	U
1,2-Dichloroethene (total)	NA	7000	7000	10	U	na		10	U	na		na		10	U	na		na		50	U	na		na	
1,2-Dichloropropane	5	16	16	10	U	0.17	U	10	U	1	U	0.17	U	10	U	1	U	0.17	U	50	U	1	U	0.17	U
cis-1,3-Dichloropropene	0.4	12*	12*	10	U	0.12	U	10	U	1	U	0.12	U	10	U	1	U	0.12	U	50	U	1	U	0.12	U
trans-1,3-Dichloropropene	0.4	12*	12*	10	U	0.15	U	10	U	1	U	0.15	U	10	U	1	U	0.15	U	50	U	1	U	0.15	U
Ethylbenzene	30	610	610	10	U	0.11	U	10	U	1	U	6		10	U	1	U	0.11	U	50	U	1	U	0.11	U
2-Hexanone	300	NA	NA	10	U	0.29	U	10	U	5	U	1.6	J	10	U	5	U	0.29	U	50	U	5	U	2.2	J
Methylene chloride	5	1580	1580	10	U	0.61	U	10	U	2	U	0.61	U	10	U	2	U	0.61	U	50	U	2	U	0.61	U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	10	U	0.41	U	10	U	5	U	0.27	U	10	U	5	U	0.27	U	50	U	5	U	0.27	U
Styrene	100	460	460	10	U	0.05	U	10	U	1	U	0.05	U	10	U	1	U	0.05	U	50	U	1	U	0.05	U
Tetrachloroethene	3	8.85	8.85	10	U	0.43	U	10	U	1	U	0.43	U	10	U	1	U	0.43	U	**10**	J	**13**		**4.2**	
1,1,2,2-Tetrachloroethane	0.2	10.8	NA	10	U	0.17	U	10	U	0.2	U	0.17	U	10	U	0.2	U	0.17	U	50	U	0.2	U	0.17	U
1,1,1-Trichloroethane	200	270	270	4	J	0.065	U	10	U	1	U	0.065	U	10	U	1	U	0.065	U	**1400**	D	**2100**	D	35	
1,1,2-Trichloroethane	5	17	17	10	U	0.11	U	10	U	1	U	0.11	U	10	U	1	U	0.11	U	50	U	1	U	0.11	U
Trichloroethene	3	80.7	80.7	10	U	0.19	U	10	U	1	U	0.19	J	10	U	1	U	0.13	U	50	U	**3**		0.62	J
Toluene	40	480	480	10	U	0.18	U	10	U	1	U	0.065	U	10	U	1	U	0.091	U	50	U	1	U	0.065	U
Vinyl chloride	1	2.6	2.6	10	U	0.13	U	10	U	1	U	**2.3**		10	U	1	U	0.19	J	50	U	1	U	0.33	J
Xylene (Total)	20	370	370	10	U	0.28	U	10	U	1	U	1.1	J	10	U	1	U	0.28	U	50	U	8		0.28	U

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	30GS27						30GS28						30GS33				30GS46					
				1993		1995		2003		1993		1995		2003		1995		2003		1993		1995		2003	
Acetone	760	1700	1700	100	U	5	U	8.9	U	50	U	5	U	2.3	U	5	U	5	U	20	U	5	U	11	U
Benzene	1	71.28	71.28	100	U	1	U	0.12	U	50	U	1	U	0.096	U	1	U	0.096	U	20	U	1	U	0.15	U
Bromodichloromethane	0.6	22	22	100	U	0.6	U	0.18	U	50	U	0.6	U	0.18	U	0.6	U	0.18	U	20	U	0.6	U	0.18	U
Bromoform	4.8	360	360	100	U	1	U	0.19	U	50	U	1	U	0.19	U	1	U	0.19	U	20	U	1	U	0.19	U
Bromomethane	11	35	35	100	U	1	UJ	0.49	U	50	U	1	UJ	0.49	U	1	U	0.49	U	20	U	1	U	0.49	U
2-Butanone (MEK)	4600	120000	120000	100	U	5	U	1.2	U	50	U	5	U	0.48	U	5	U	0.48	U	20	U	5	UJ	5.1	U
Carbon disulfide	760	110	110	100	U	1	U	0.72	U	50	UJ	1	U	0.72	U	1	U	0.72	U	20	U	1	U	0.72	U
Carbon tetrachloride	3	4.42	4.42	100	U	1	U	0.15	U	50	U	1	U	0.15	U	1	U	0.15	U	20	U	1	U	0.15	U
Chlorobenzene	100	17	17	100	U	1	U	0.1	U	50	U	1	U	0.57	J	1	U	0.1	U	20	U	1	U	0.1	U
Chloroethane	13	NA	NA	100	U	**520**	D	0.86	U	50	U	**580**	D	0.86	U	1	U	0.86	U	20	U	1	U	0.86	U
Chloroform	76	470.8	470.8	100	U	1	U	0.26	U	50	U	1	U	0.12	U	0.5	J	0.12	U	20	U	1	U	0.12	U
Chloromethane	2.9	470.8	470.8	100	U	1	U	0.4	U	50	UJ	1	U	0.4	U	1	U	0.4	U	20	U	1	U	0.4	U
Dibromochloromethane	0.5	34	34	100	U	1	U	0.078	U	50	U	1	U	0.078	U	1	U	0.078	U	20	U	1	U	0.078	U
1,1-Dichloroethane	76	NA	NA	45	J	**4300**	D	1.6		**380**		**2400**	D	7.1		2		0.12	U	18	J	8		0.25	J
1,2-Dichloroethane	3	40	40	100	U	**200**	D	0.18	U	**6**	J	**220**	D	0.18	U	2		0.18	U	20	U	1	U	0.18	U
1,1-Dichloroethene	7	3.2	3.2	**510**		**240**	D	1.5		**220**		**130**	D	0.31	U	0.3	J	0.31	U	20	U	1	U	0.31	U
cis-1,2-Dichloroethene	70	NA	NA	na		200	UD	1.9		na		**120**	D	12		1	U	0.16	U	na		**190**	D	39	
trans-1,2-Dichloroethene	100	11000	11000	na		1	U	0.36	U	na		1	U	0.36	U	1	U	0.36	U	na		1	U	0.36	U
1,2-Dichloroethene (total)	NA	7000	7000	15	J	na		na		210		na		na		na		na		220		na		na	
1,2-Dichloropropane	5	16	16	100	U	1	U	0.17	U	50	U	1	U	0.17	U	1	U	0.17	U	20	U	1	U	0.17	U
cis-1,3-Dichloropropene	0.4	12*	12*	100	U	1	U	0.12	U	50	U	1	U	0.12	U	1	U	0.12	U	20	U	1	U	0.12	U
trans-1,3-Dichloropropene	0.4	12*	12*	100	U	1	U	0.15	U	50	U	1	U	0.15	U	1	U	0.15	U	20	U	1	U	0.15	U
Ethylbenzene	30	610	610	100	U	1	U	0.11	U	50	U	1	U	0.12	J	1	U	0.11	U	20	U	1	U	3.5	
2-Hexanone	300	NA	NA	100	U	5	U	0.29	U	50	U	5	U	0.29	U	5	U	0.29	U	20	U	5	U	4.6	J
Methylene chloride	5	1580	1580	100	U	3		0.61	U	50	U	2	U	0.61	U	2	U	0.61	U	20	U	2	U	0.61	U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	100	U	5	U	0.27	U	50	U	5	U	0.27	U	5	U	0.27	U	20	U	5	U	2.4	J
Styrene	100	460	460	100	U	1	U	0.13	U	50	U	1	U	0.05	U	1	U	0.05	U	20	U	1	U	0.05	U
Tetrachloroethene	3	8.85	8.85	**11**	J	**12**		0.73	J	**310**		**10**		**6.4**		1		2.6		**200**		**1100**	D	**35**	
1,1,2,2-Tetrachloroethane	0.2	10.8	NA	100	U	0.2	U	0.17	U	50	U	0.2	U	0.17	U	0.2	U	0.17	U	20	U	0.2	U	0.17	U
1,1,1-Trichloroethane	200	270	270	**1300**		**1700**	D	0.63	J	**1300**	D	**2000**	D	1.5		14		2.1		**220**		49	DJ	0.28	J
1,1,2-Trichloroethane	5	17	17	100	U	1	U	0.11	U	50	U	1	U	0.11	U	1	U	0.11	U	20	U	1	U	0.11	U
Trichloroethene	3	80.7	80.7	100	U	**3**		0.13	U	**36**	J	**5**		0.9	J	1		0.85	J	**4**	J	**58**	D	1.4	
Toluene	40	480	480	100	U	1	U	0.14	U	50	U	0.2	J	0.065	U	1	U	0.065	U	20	U	1	U	0.27	U
Vinyl chloride	1	2.6	2.6	100	U	0.5	J	0.13	U	50	U	0.2	J	0.13	U	1	U	0.13	U	20	U	1	U	0.13	U
Xylene (Total)	20	370	370	100	U	0.8	J	0.28	U	50	U	1	U	0.28	U	1	U	0.28	U	6	J	10		2.6	

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	30GS101 1993	30GS101 2003	30GS111 1993	30GS111 1995	30GS111 2003	30GS113 1993	30GS113 2003	30GS123 1993	30GS123 2003	30GS126 1993	30GS126 2003
Acetone	760	1700	1700	10 U	14 U	21 J	5 U	4.6 U	10 UJ	11 U	10 U	26 U	10 U	3 U
Benzene	1	71.28	71.28	**1** J	0.11 U	100 U	1 U	**9.8**	10 U	0.14 U	10 U	0.44 U	10 U	0.096 U
Bromodichloromethane	0.6	22	22	10 U	0.18 U	100 U	0.6 U	0.36 U	10 U	0.18 U	10 U	0.18 U	10 U	0.18 U
Bromoform	4.8	360	360	10 U	0.19 U	100 U	1 U	0.38 U	10 U	0.19 U	10 U	0.55 J	10 U	0.19 U
Bromomethane	11	35	35	10 U	0.49 U	100 U	1 U	0.98 U	10 U	0.49 U	10 U	0.49 U	10 U	0.49 U
2-Butanone (MEK)	4600	120000	120000	10 U	1.2 U	100 U	5 UJ	0.96 U	10 UJ	2.2 U	10 U	19 U	10 U	0.61 U
Carbon disulfide	760	110	110	10 U	0.72 U	100 U	1 U	1.4 U	10 U	0.72 U	10 U	0.72 U	10 U	0.72 U
Carbon tetrachloride	3	4.42	4.42	10 U	0.15 U	100 U	1 U	0.3 U	10 U	0.15 U	10 U	0.15 U	10 U	0.15 U
Chlorobenzene	100	17	17	10 U	0.1 U	**720**	19 J	**830** D	3 J	0.1 U	25	0.1 U	3 J	0.1 U
Chloroethane	13	NA	NA	10 U	0.86 U	100 U	1 U	**32**	10 U	0.86 U	10 U	0.86 U	10 U	0.86 U
Chloroform	76	470.8	470.8	10 U	0.12 U	100 U	1 U	0.24 U	10 U	0.12 U	10 U	0.35 U	10 U	2.2
Chloromethane	2.9	470.8	470.8	10 U	0.4 U	100 U	1 U	0.8 U	10 U	0.4 U	10 U	0.4 U	10 U	0.4 U
Dibromochloromethane	0.5	34	34	10 U	0.078 U	100 U	1 U	0.16 U	10 U	0.078 U	10 U	0.078 U	10 U	0.078 U
1,1-Dichloroethane	76	NA	NA	10 U	0.12 U	100 U	1 U	0.24 U	10 U	0.12 U	10 U	0.34 U	10 U	0.12 U
1,2-Dichloroethane	3	40	40	10 U	0.18 U	100 U	1 U	0.36 U	10 U	0.18 U	10 U	0.22 J	10 U	0.18 U
1,1-Dichloroethene	7	3.2	3.2	10 U	0.31 U	100 U	1 U	0.62 U	10 U	0.31 U	10 U	0.78 J	10 U	0.31 U
cis-1,2-Dichloroethene	70	NA	NA	na	0.16 U	na	1 U	0.32 U	na	0.16 U	na	0.47 J	na	0.16 U
trans-1,2-Dichloroethene	100	11000	11000	na	0.36 U	na	1 U	0.72 U	na	0.36 U	na	0.42 J	na	0.36 U
1,2-Dichloroethene (total)	NA	7000	7000	10 U	na	100 U	na	na	10 U	na	10 U	na	10 U	na
1,2-Dichloropropane	5	16	16	10 U	0.17 U	100 U	1 U	0.34 U	10 U	0.17 U	10 U	0.26 J	10 U	0.17 U
cis-1,3-Dichloropropene	0.4	12*	12*	10 U	0.12 U	100 U	1 U	0.24 U	10 U	0.12 U	10 U	0.24 J	10 U	0.12 U
trans-1,3-Dichloropropene	0.4	12*	12*	10 U	0.15 U	100 U	1 U	0.3 U	10 U	0.15 U	10 U	0.23 J	10 U	0.15 U
Ethylbenzene	30	610	610	5 J	0.11 U	100 U	1 U	0.22 U	1 J	0.11 U	10 U	0.4 U	1 J	0.11 U
2-Hexanone	300	NA	NA	10 U	0.29 U	100 U	5 U	0.58 U	10 UJ	0.29 U	10 U	9 J	10 U	0.29 U
Methylene chloride	5	1580	1580	10 U	0.61 U	100 U	2 U	1.2 U	10 U	0.61 U	10 U	0.63 J	10 U	0.61 U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	10 U	0.27 U	100 U	5 U	0.54 U	10 UJ	0.27 U	10 U	7.5 J	10 U	0.27 U
Styrene	100	460	460	10 U	0.19 U	100 U	1 U	0.1 U	10 U	0.05 U	10 U	0.37 U	10 U	0.05 U
Tetrachloroethene	3	8.85	8.85	10 U	0.43 U	100 U	0.7 J	0.86 U	10 U	0.43 U	10 U	0.43 U	10 U	0.43 U
1,1,2,2-Tetrachloroethane	0.2	10.8	NA	10 U	0.17 U	100 U	0.2 U	0.34 U	10 UJ	0.17 U	10 U	0.17 U	10 UJ	0.17 U
1,1,1-Trichloroethane	200	270	270	10 U	0.065 U	100 U	1 U	0.13 U	10 U	0.065 U	10 U	0.3 J	10 U	0.065 U
1,1,2-Trichloroethane	5	17	17	10 U	0.11 U	100 U	1 U	0.22 U	10 U	0.11 U	10 U	0.36 J	10 U	0.11 U
Trichloroethene	3	80.7	80.7	10 U	0.13 U	100 U	1 U	0.26 U	10 U	0.13 U	10 U	0.85 J	10 U	0.13 U
Toluene	40	480	480	2 J	0.11 U	100 U	1 U	0.73 U	10 U	0.12 U	10 U	0.63 U	10 U	0.065 U
Vinyl chloride	1	2.6	2.6	10 U	0.13 U	100 U	1 U	0.26 U	10 U	0.13 U	10 U	0.13 U	10 U	0.13 U
Xylene (Total)	20	370	370	**21**	0.28 U	100 U	1 U	0.56 U	6 J	0.28 U	10 U	0.42 U	5 J	0.28 U

Table B-12: Summary of Groundwater VOCs
NAS Pensacola, Operable Unit 2

Parameter	Groundwater CTL	Freshwater Surface	Marine Surface	30GS146				30GS162						30GS170				30GS029 (30GS174)			
				1993		2003		1993		1995		2003		1993		2003		1993		2003	
Acetone	760	1700	1700	10	U	2.8	U	50	U	5	UJ	2.3	U	43		5.9	U	**160**		2.3	U
Benzene	1	71.28	71.28	10	U	0.096	U	50	U	1	U	0.096	U	**2**	J	0.096	U	**3**	J	0.096	U
Bromodichloromethane	0.6	22	22	10	U	0.18	U	50	U	0.6	U	0.18	U	10	U	0.18	U	10	U	0.18	U
Bromoform	4.8	360	360	10	U	0.19	U	50	U	1	U	0.19	U	10	U	0.19	U	10	U	0.19	U
Bromomethane	11	35	35	10	U	0.49	U	50	U	1	U	0.49	U	10	U	0.49	U	10	U	0.49	U
2-Butanone (MEK)	4600	120000	120000	10	U	0.76	U	50	U	5	UJ	0.66	U	10	U	0.48	U	10	U	0.6	U
Carbon disulfide	760	110	110	10	U	0.72	U	50	U	1	U	0.72	U	10	U	0.72	U	10	U	0.72	U
Carbon tetrachloride	3	4.42	4.42	10	U	0.15	U	50	U	1	U	0.15	U	10	U	0.15	U	10	U	0.15	U
Chlorobenzene	100	17	17	10	U	0.1	U	50	U	1	U	0.1	U	10	U	0.1	U	10	U	0.1	U
Chloroethane	13	NA	NA	10	U	0.86	U	50	U	1	U	0.86	U	10	U	0.86	U	10	U	0.86	U
Chloroform	76	470.8	470.8	2	J	1.6		50	U	2		2.3		1	J	9.6		10	U	0.12	U
Chloromethane	2.9	470.8	470.8	10	U	0.4	U	50	U	1	U	0.4	U	10	U	0.4	U	10	U	0.4	U
Dibromochloromethane	0.5	34	34	10	U	0.078	U	50	U	1	U	0.078	U	10	U	0.078	U	10	U	0.078	U
1,1-Dichloroethane	76	NA	NA	10	U	16		28	J	8		1.2		9	J	0.13	J	11		0.41	J
1,2-Dichloroethane	3	40	40	10	U	0.18	U	50	U	1	U	0.18	U	10	U	0.18	U	10	U	0.18	U
1,1-Dichloroethene	7	3.2	3.2	10	U	0.31	U	**100**		0.7	J	0.31	U	**7**	J	0.31	U	2	J	0.31	U
cis-1,2-Dichloroethene	70	NA	NA	na		0.98	J	na		1	U	0.63	J	na		0.16	U	na		0.16	U
trans-1,2-Dichloroethene	100	11000	11000	na		0.36	U	na		1	U	0.36	U	na		0.36	U	na		0.36	U
1,2-Dichloroethene (total)	NA	7000	7000	10	U	na		50	U	na		na		10	U	na		10	U	na	
1,2-Dichloropropane	5	16	16	10	U	0.17	U	50	U	1	U	0.17	U	10	U	0.17	U	10	U	0.17	U
cis-1,3-Dichloropropene	0.4	12*	12*	10	U	0.12	U	50	U	1	U	0.12	U	10	U	0.12	U	10	U	0.12	U
trans-1,3-Dichloropropene	0.4	12*	12*	10	U	0.15	U	50	U	1	U	0.15	U	10	U	0.15	U	10	U	0.15	U
Ethylbenzene	30	610	610	10	U	0.11	U	50	U	1	U	0.11	U	10	U	0.11	U	10	U	0.11	U
2-Hexanone	300	NA	NA	10	U	0.29	U	50	U	5	UJ	0.29	U	10	U	0.29	U	10	U	0.29	U
Methylene chloride	5	1580	1580	10	U	0.61	U	50	U	1	J	0.61	U	10	U	0.61	U	10	U	0.61	U
4-Methyl-2-Pentanone (MIBK)	610	23000	23000	10	U	0.27	U	50	U	5	UJ	0.27	U	10	U	0.27	U	10	U	0.27	U
Styrene	100	460	460	10	U	0.05	U	50	U	1	U	0.097	U	10	U	0.14	U	10	U	0.05	U
Tetrachloroethene	3	8.85	8.85	10	U	0.5	J	50	U	0.3	J	0.43	U	10	U	0.43	U	1	J	1	
1,1,2,2-Tetrachloroethane	0.2	10.8	NA	10	UJ	0.17	U	50	U	0.2	U	0.17	U	10	U	0.17	U	10	U	0.17	U
1,1,1-Trichloroethane	200	270	270	2	J	0.065	U	**260**		3		0.065	U	33		0.065	U	26		1.2	
1,1,2-Trichloroethane	5	17	17	10	U	0.11	U	50	U	1	U	0.11	U	10	U	0.11	U	10	U	0.11	U
Trichloroethene	3	80.7	80.7	1	J	0.15	U	50	U	1	U	0.13	U	2	J	0.2	J	1	J	0.27	J
Toluene	40	480	480	10	U	0.065	U	50	U	1	U	0.065	U	10	U	0.065	U	10	U	0.065	U
Vinyl chloride	1	2.6	2.6	10	U	0.13	U	50	U	1	U	0.13	U	10	U	0.13	U	10	U	0.13	U
Xylene (Total)	20	370	370	1	J	0.28	U	50	U	1	U	0.28	U	10	U	0.28	U	10	U	0.28	U

Appendix C

Cost Estimates for Remedial Action Alternatives

Cost Estimates for

Remedial Action Alternatives for Soil Contamination at OU 2

Alternative 1

No Action

Subsections:

Site cost over time and present value
Phase technology cost detail for 5-year reviews

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	Reviewer
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
	4545 Fuller Drive, Suite 230	5724 Summer Trees Dr.
Business Address:	Irving, TX 75038	Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/9/2004	1/6/2005

Phase	Phase Name	Fiscal Year 1 2010	Fiscal Year 2 2011	Fiscal Year 3 2012	Fiscal Year 4 2013
Long Term Monitoring	LTM	$16,625			
Sub-Total		$16,625	$0	$0	$0
Escalation Factor		1.0944			
Total		$18,195	$0	$0	$0
		2010	**2011**	**2012**	**2013**
Discount Rate	6.0%				
Present Value	2005	$13,596	$0	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 5 2014**	**Fiscal Year 6 2015**	**Fiscal Year 7 2016**	**Fiscal Year 8 2017**
Long Term Monitoring	LTM		$16,625		
Sub-Total		$0	$16,625	$0	$0
Escalation Factor			1.2083		
Total		$0	$20,088	$0	$0
		2014	**2015**	**2016**	**2017**
Discount Rate	6.0%				
Present Value	2005	$0	$11,217	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 9 2018**	**Fiscal Year 10 2019**	**Fiscal Year 11 2020**	**Fiscal Year 12 2021**
Long Term Monitoring	LTM			$16,625	
Sub-Total		$0	$0	$16,625	$0
Escalation Factor				1.3340	
Total		$0	$0	$22,178	$0
		2018	**2019**	**2020**	**2021**
Discount Rate	6.0%				
Present Value	2005	$0	$0	$9,254	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 13 2022**	**Fiscal Year 14 2023**	**Fiscal Year 15 2024**	**Fiscal Year 16 2025**
Long Term Monitoring	LTM				$16,625
Sub-Total		$0	$0	$0	$16,625
Escalation Factor					1.4729
Total		$0	$0	$0	$24,487
		2022	**2023**	**2024**	**2025**
Discount Rate	6.0%				
Present Value	2005	$0	$0	$0	$7,635

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 17 2026**	**Fiscal Year 18 2027**	**Fiscal Year 19 2028**	**Fiscal Year 20 2029**
Long Term Monitoring	LTM				
Sub-Total		$0	$0	$0	$0
Escalation Factor					
Total		$0	$0	$0	$0
		2026	**2027**	**2028**	**2029**
Discount Rate	6.0%				
Present Value	2005	$0	$0	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 21 2030**	**Fiscal Year 22 2031**	**Fiscal Year 23 2032**	**Fiscal Year 24 2033**
Long Term Monitoring	LTM	$16,625			
Sub-Total		$16,625	$0	$0	$0
Escalation Factor		1.6262			
Total		$27,036	$0	$0	$0
		2030	**2031**	**2032**	**2033**
Discount Rate	6.0%				
Present Value	2005	$6,299	$0	$0	$0

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/14/2005
Time: 1:27 PM

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	Phase Name	Fiscal Year 25 2034	Fiscal Year 26 2035	Row Total
Long Term Monitoring	LTM		$16,625	$99,750
Sub-Total		$0	$16,625	$99,750
Escalation Factor			1.7954	
Total		$0	$29,849	$141,832
		2034	**2035**	
Discount Rate	6.0%			
Present Value	2005	$0	$5,197	$53,199

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

---

Site

Name: Alternative 1: No Action
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes conducting six Five-Year Reviews
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038
Phone: 972-791-3222

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 11:06:21 AM

Phase Technology Cost Detail Report
(with Markups)

Email: anoell@ensafe.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: None
Start Date: 1/1/2005
Description: Includes six Five-Year Reviews

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Phase Technology Cost Detail Report
(with Markups)

Technology: Five-Year Review

Element: Document Review

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220105	Project Engineer	4.00	HR	0.00	100.61	0.00	$402.46	☐
33220108	Project Scientist	1.00	HR	0.00	116.47	0.00	$116.47	☐
33220109	Staff Scientist	3.00	HR	0.00	86.32	0.00	$258.96	☐
				Total Element Cost			**$777.88**	

Element: Interviews

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	10.00	HR	0.00	103.76	0.00	$1,037.56	☐
				Total Element Cost			**$1,037.56**	

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	5.00	HR	0.00	103.76	0.00	$518.78	☐
33220105	Project Engineer	6.00	HR	0.00	100.61	0.00	$603.68	☐
33220108	Project Scientist	6.00	HR	0.00	116.47	0.00	$698.79	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220109	Staff Scientist	6.00	HR	0.00	86.32	0.00	$517.91	☐

Total Element Cost **$2,339.17**

Element: Report

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	12.00	HR	0.00	103.76	0.00	$1,245.07	☐
33220105	Project Engineer	31.00	HR	0.00	100.61	0.00	$3,119.04	☐
33220108	Project Scientist	25.00	HR	0.00	116.47	0.00	$2,911.63	☐
33220109	Staff Scientist	50.00	HR	0.00	86.32	0.00	$4,315.94	☐

Total Element Cost **$11,591.68**

Element: Travel

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010108	Sedan, Automobile, Rental	2.00	DAY	69.41	0.00	0.00	$138.83	☐
33010202	Sample collection, sampling personnel travel, per diem	2.00	DAY	120.00	0.00	0.00	$240.00	☑
33041101	Airfare	1.00	LS	500.00	0.00	0.00	$500.00	☑

Phase Technology Cost Detail Report
(with Markups)

Total Element Cost	**$878.83**
Total 1st Year Technology Cost	**$16,625.11**
Total Phase Cost	**$16,625.11**

Cost Estimates for

Remedial Action Alternatives for Soil Contamination at OU 2

Alternative 2

Institutional Controls

Subsections:

Site cost over time and present value
Phase technology cost detail for institutional controls
Phase technology cost detail for 5-year reviews

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Institutional Controls
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	Reviewer
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/9/2004	1/6/2005

Phase	Phase Name	Fiscal Year 1 2005	Fiscal Year 2 2006	Fiscal Year 3 2007	Fiscal Year 4 2008
Remedial Action	Institutional Controls (Capital)	$21,923			
Long Term Monitoring	LTM				
Sub-Total		$21,923	$0	$0	$0
Escalation Factor		1.0000			
Total		$21,923	$0	$0	$0
		2005	**2006**	**2007**	**2008**
Discount Rate	6.0%				
Present Value	2005	$21,923	$0	$0	$0

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/17/2005
Time: 1:02 PM

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Institutional Controls
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**
Remedial Action	Institutional Controls (Capital)				
Long Term Monitoring	LTM		$16,625		
Sub-Total		$0	$16,625	$0	$0
Escalation Factor			1.0944		
Total		$0	$18,195	$0	$0
		2009	**2010**	**2011**	**2012**
Discount Rate	6.0%				
Present Value	2005	$0	$13,596	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Institutional Controls
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 9 2013**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**
Remedial Action	Institutional Controls (Capital)				
Long Term Monitoring	LTM			$16,625	
Sub-Total		$0	$0	$16,625	$0
Escalation Factor				1.2083	
Total		$0	$0	$20,088	$0
		2013	**2014**	**2015**	**2016**
Discount Rate	6.0%				
Present Value	2005	$0	$0	$11,217	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Institutional Controls
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 13 2017**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**	**Fiscal Year 16 2020**
Remedial Action	Institutional Controls (Capital)				
Long Term Monitoring	LTM				$16,625
Sub-Total		$0	$0	$0	$16,625
Escalation Factor					1.3340
Total		$0	$0	$0	$22,178
		2017	**2018**	**2019**	**2020**
Discount Rate	6.0%				
Present Value	2005	$0	$0	$0	$9,254

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Institutional Controls
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 17 2021**	**Fiscal Year 18 2022**	**Fiscal Year 19 2023**	**Fiscal Year 20 2024**
Remedial Action	Institutional Controls (Capital)				
Long Term Monitoring	LTM				
Sub-Total		$0	$0	$0	$0
Escalation Factor					
Total		$0	$0	$0	$0
		2021	**2022**	**2023**	**2024**
Discount Rate	6.0%				
Present Value	2005	$0	$0	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Institutional Controls
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 21 2025**	**Fiscal Year 22 2026**	**Fiscal Year 23 2027**	**Fiscal Year 24 2028**
Remedial Action	Institutional Controls (Capital)				
Long Term Monitoring	LTM	$16,625			
Sub-Total		$16,625	$0	$0	$0
Escalation Factor		1.4729			
Total		$24,487	$0	$0	$0
		2025	**2026**	**2027**	**2028**
Discount Rate	6.0%				
Present Value	2005	$7,635	$0	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Institutional Controls
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**	**Fiscal Year 28 2032**
Remedial Action	Institutional Controls (Capital)				
Long Term Monitoring	LTM		$16,625		
Sub-Total		$0	$16,625	$0	$0
Escalation Factor			1.6262		
Total		$0	$27,036	$0	$0
		2029	**2030**	**2031**	**2032**
Discount Rate	6.0%				
Present Value	2005	$0	$6,299	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Institutional Controls
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**	**Fiscal Year 31 2035**	**Row Total**
Remedial Action	Institutional Controls (Capital)				$21,923
Long Term Monitoring	LTM			$16,625	$99,750
Sub-Total		$0	$0	$16,625	$121,673
Escalation Factor				1.7954	
Total		$0	$0	$29,849	$163,755
		2033	**2034**	**2035**	
Discount Rate	6.0%				
Present Value	2005	$0	$0	$5,197	$75,121

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name: Alternative 2: Institutional Controls
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038
Phone: 972-791-3222

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:08:53 AM

Phase Technology Cost Detail Report
(with Markups)

Email: anoell@yahoo.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com

Date Reviewed: 01/06/2005

Phase

Name:	Institutional Controls	**Media/Waste Type:**	N/A
Type:	Remedial Action	**Secondary Media/Waste Type:**	N/A
Labor Rate Group:	System Labor Rate	**Contaminant:**	None
Analysis Rate Group:	System Analysis Rate	**Secondary Contaminant:**	None
Approach:	None	**Markup Template:**	System Defaults
Start Date:	1/1/2005	**O&M Markup Template:**	N/A
Description:	Institutional controls used to maintain C/I status		

Phase Technology Cost Detail Report
(with Markups)

Technology: MEC Institutional Controls

Element: Planning

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	80.00	MI	0.16	0.00	0.00	$12.86	☐
33040927	UXO Senior Scientist	64.00	HR	0.00	80.94	0.00	$5,180.41	☐
33040929	UXO Word Processor	12.00	HR	0.00	27.39	0.00	$328.62	☐
33240101	Other Direct Costs	1.00	LS	75.31	0.00	0.00	$75.31	☑
				Total Element Cost			**$5,597.21**	

Element: Implementation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	80.00	MI	0.16	0.00	0.00	$12.86	☐
33040927	UXO Senior Scientist	196.00	HR	0.00	80.94	0.00	$15,865.00	☐
33240101	Other Direct Costs	1.00	LS	216.89	0.00	0.00	$216.89	☑
33990105	Letter/Brochure Printing and Distribution, per Page	100.00	EA	2.31	0.00	0.00	$230.53	☐
				Total Element Cost			**$16,325.29**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$21,922.50**
Total Phase Cost	**$21,922.50**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name: Alternative 2: Institutional Controls
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038
Phone: 972-791-3222

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 11:09:43 AM

Phase Technology Cost Detail Report
(with Markups)

Email: anoell@yahoo.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group:
Analysis Rate Group:
Approach: Ex Situ
Start Date: 1/1/2005
Description: This estimate was imported or upgraded from a previous version of RACER and contained no information in this Description field.

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Phase Technology Cost Detail Report
(with Markups)

Technology: Five-Year Review

Element: Document Review

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220105	Project Engineer	4.00	HR	0.00	100.61	0.00	$402.46	☐
33220108	Project Scientist	1.00	HR	0.00	116.47	0.00	$116.47	☐
33220109	Staff Scientist	3.00	HR	0.00	86.32	0.00	$258.96	☐

Total Element Cost **$777.88**

Element: Interviews

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	10.00	HR	0.00	103.76	0.00	$1,037.56	☐

Total Element Cost **$1,037.56**

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	5.00	HR	0.00	103.76	0.00	$518.78	☐
33220105	Project Engineer	6.00	HR	0.00	100.61	0.00	$603.68	☐
33220108	Project Scientist	6.00	HR	0.00	116.47	0.00	$698.79	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220109	Staff Scientist	6.00	HR	0.00	86.32	0.00	$517.91	☐

Total Element Cost **$2,339.17**

Element: Report

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	12.00	HR	0.00	103.76	0.00	$1,245.07	☐
33220105	Project Engineer	31.00	HR	0.00	100.61	0.00	$3,119.04	☐
33220108	Project Scientist	25.00	HR	0.00	116.47	0.00	$2,911.63	☐
33220109	Staff Scientist	50.00	HR	0.00	86.32	0.00	$4,315.94	☐

Total Element Cost **$11,591.68**

Element: Travel

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010108	Sedan, Automobile, Rental	2.00	DAY	69.41	0.00	0.00	$138.83	☐
33010202	Sample collection, sampling personnel travel, per diem	2.00	DAY	120.00	0.00	0.00	$240.00	☑
33041101	Airfare	1.00	LS	500.00	0.00	0.00	$500.00	☑

Phase Technology Cost Detail Report
(with Markups)

Total Element Cost	**$878.83**
Total 1st Year Technology Cost	**$16,625.11**
Total Phase Cost	**$16,625.11**

Cost Estimates for

Remedial Action Alternatives for Soil Contamination at OU 2

Alternative 3

Soil and Asphalt Capping

Subsections:

Site cost over time and present value
Phase technology cost detail for asphalt caps
Phase technology cost detail for soil caps
Phase technology cost detail for excavation
Phase technology cost detail for institutional controls
Phase technology cost detail for 5-year reviews
Phase cost summary for design

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: Soil and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	**Reviewer**
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/9/2004	1/6/2005

Phase	**Phase Name**	**Fiscal Year 1 2005**	**Fiscal Year 2 2006**	**Fiscal Year 3 2007**	**Fiscal Year 4 2008**
Design	Design	$91,783			
Remedial Action	Institutional Controls (Capital)	$21,923			
Remedial Action	Soil cover construction (Capital)	$669,443			
Remedial Action	Soil cover construction (O&M)	$11,657	$15,543	$15,543	$15,543
Remedial Action	Asphalt Cap Construction (Capital)	$1,833,878			
Remedial Action	Excavation and Fill (Capital)	$25,349			
Long Term Monitoring	LTM				
Sub-Total		$2,654,033	$15,543	$15,543	$15,543
Escalation Factor		1.0000	1.0150	1.0323	1.0519
Total		$2,654,032	$15,776	$16,045	$16,349
		2005	**2006**	**2007**	**2008**
Discount Rate	6.0%				
Present Value	2005	$2,654,032	$15,776	$16,045	$16,349

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/17/2005
Time: 1:08 PM

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: Soil and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**
Design	Design				
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Soil cover construction (Capital)				
Remedial Action	Soil cover construction (O&M)	$15,543	$15,543	$15,543	$15,543
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Long Term Monitoring	LTM		$16,625		
Sub-Total		$15,543	$32,168	$15,543	$15,543
Escalation Factor		1.0729	1.0944	1.1163	1.1386
Total		$16,676	$35,204	$17,350	$17,697
		2009	**2010**	**2011**	**2012**
Discount Rate	6.0%				
Present Value	2005	$16,676	$35,204	$17,350	$17,697

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: Soil and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 9 2013**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**
Design	Design				
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Soil cover construction (Capital)				
Remedial Action	Soil cover construction (O&M)	$15,543	$15,543	$15,543	$15,543
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Long Term Monitoring	LTM			$16,625	
Sub-Total		$15,543	$15,543	$32,168	$15,543
Escalation Factor		1.1613	1.1846	1.2083	1.2324
Total		$18,050	$18,412	$38,868	$19,155
		2013	**2014**	**2015**	**2016**
Discount Rate	6.0%				
Present Value	2005	$18,050	$18,412	$38,868	$19,155

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: Soil and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 13 2017**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**	**Fiscal Year 16 2020**
Design	Design				
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Soil cover construction (Capital)				
Remedial Action	Soil cover construction (O&M)	$15,543	$15,543	$15,543	$15,543
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Long Term Monitoring	LTM				$16,625
Sub-Total		$15,543	$15,543	$15,543	$32,168
Escalation Factor		1.2571	1.2822	1.3079	1.3340
Total		$19,539	$19,929	$20,328	$42,912
		2017	**2018**	**2019**	**2020**
Discount Rate	6.0%				
Present Value	2005	$19,539	$19,929	$20,328	$42,912

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: Soil and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	Phase Name	Fiscal Year 17 2021	Fiscal Year 18 2022	Fiscal Year 19 2023	Fiscal Year 20 2024
Design	Design				
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Soil cover construction (Capital)				
Remedial Action	Soil cover construction (O&M)	$15,543	$15,543	$15,543	$15,543
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Long Term Monitoring	LTM				
Sub-Total		$15,543	$15,543	$15,543	$15,543
Escalation Factor		1.3607	1.3879	1.4157	1.4440
Total		$21,149	$21,572	$22,004	$22,444

		2021	**2022**	**2023**	**2024**
Discount Rate	6.0%				
Present Value	2005	$21,149	$21,572	$22,004	$22,444

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: Soil and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 21 2025**	**Fiscal Year 22 2026**	**Fiscal Year 23 2027**	**Fiscal Year 24 2028**
Design	Design				
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Soil cover construction (Capital)				
Remedial Action	Soil cover construction (O&M)	$15,543	$15,543	$15,543	$15,543
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Long Term Monitoring	LTM	$16,625			
Sub-Total		$32,168	$15,543	$15,543	$15,543
Escalation Factor		1.4729	1.5023	1.5324	1.5630
Total		$47,380	$23,350	$23,818	$24,293
		2025	**2026**	**2027**	**2028**
Discount Rate	6.0%				
Present Value	2005	$47,380	$23,350	$23,818	$24,293

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: Soil and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**	**Fiscal Year 28 2032**
Design	Design				
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Soil cover construction (Capital)				
Remedial Action	Soil cover construction (O&M)	$15,543	$15,543	$15,543	$15,543
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Long Term Monitoring	LTM		$16,625		
Sub-Total		$15,543	$32,168	$15,543	$15,543
Escalation Factor		1.5943	1.6262	1.6587	1.6919
Total		$24,780	$52,311	$25,781	$26,297
		2029	**2030**	**2031**	**2032**
Discount Rate	6.0%				
Present Value	2005	$24,780	$52,311	$25,781	$26,297

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: Soil and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**	**Fiscal Year 31 2035**	**Row Total**
Design	Design				$91,783
Remedial Action	Institutional Controls (Capital)				$21,923
Remedial Action	Soil cover construction (Capital)				$669,443
Remedial Action	Soil cover construction (O&M)	$15,543	$15,543	$3,886	$466,290
Remedial Action	Asphalt Cap Construction (Capital)				$1,833,878
Remedial Action	Excavation and Fill (Capital)				$25,349
Long Term Monitoring	LTM			$16,625	$99,750
Sub-Total		$15,543	$15,543	$20,511	$3,208,416
Escalation Factor		1.7257	1.7602	1.7954	
Total		$26,822	$27,358	$36,825	$3,412,505
		2033	**2034**	**2035**	
Discount Rate	6.0%				
Present Value	2005	$26,822	$27,358	$36,825	$3,412,505

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Soil
ID:	NAS Pensacola OU 2 Feasibility Study
Location:	PENSACOLA NAS, FLORIDA
Modifiers:	**Material** 1.005
	Labor 0.7
	Equipment 0.913
Category:	None
Report Option:	Fiscal Year
Description:	Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name:	Alternative 3: Soil and Asphalt Capping
ID:	NAS Pensacola OU 2 Feasibility Study
Type:	None
Description:	Includes the construction of 4 asphalt caps and 4 soil caps, as specified in Figure 6-1, and the excavation and consolidation of 950 CY of soil. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program:	Superfund Remedial

Estimator Information:

Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:13:08 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@yahoo.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Asphalt Cap Construction
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: In Situ
Start Date: 1/1/2005

Media/Waste Type: Soil
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Description: Construction 4 asphalt caps as specified on Figure 6-1. Includes clearing and grubbing with offsite disposal.

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	3,895.84	CY	7.66	1.59	2.15	$44,448.03	☐
18010102	Gravel, Delivered & Dumped	6,545.02	CY	26.67	2.32	1.89	$202,074.88	☐
18010330	Hydraulic Asphalt Concrete	18,700.05	SY	21.79	0.00	0.00	$407,490.94	☐
33080535	16 oz/sy Geotextile/Drainage Fabric (170 Mil)	41,140.11	SY	2.07	0.91	0.05	$124,827.32	☐

Total Element Cost **$778,841.16**

Total 1st Year Technology Cost **$778,841.16**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	256.65	CY	7.66	1.59	2.15	$2,928.15	☐
18010102	Gravel, Delivered & Dumped	431.17	CY	26.67	2.32	1.89	$13,312.20	☐
18010330	Hydraulic Asphalt Concrete	1,231.92	SY	21.79	0.00	0.00	$26,844.65	☐
33080535	16 oz/sy Geotextile/Drainage Fabric (170 Mil)	2,710.22	SY	2.07	0.91	0.05	$8,223.35	☐

Total Element Cost **$51,308.34**

Total 1st Year Technology Cost **$51,308.34**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	836.70	CY	7.66	1.59	2.15	$9,545.99	☐
18010102	Gravel, Delivered & Dumped	1,405.66	CY	26.67	2.32	1.89	$43,399.19	☐
18010330	Hydraulic Asphalt Concrete	4,016.18	SY	21.79	0.00	0.00	$87,516.18	☐
33080535	16 oz/sy Geotextile/Drainage Fabric (170 Mil)	8,835.60	SY	2.07	0.91	0.05	$26,808.98	☐

Total Element Cost **$167,270.34**

Total 1st Year Technology Cost **$167,270.34**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	3,635.64	CY	7.66	1.59	2.15	$41,479.38	☐
18010102	Gravel, Delivered & Dumped	6,107.88	CY	26.67	2.32	1.89	$188,578.35	☐
18010330	Hydraulic Asphalt Concrete	17,451.07	SY	21.79	0.00	0.00	$380,274.53	☐
33080535	16 oz/sy Geotextile/Drainage Fabric (170 Mil)	38,392.36	SY	2.07	0.91	0.05	$116,490.10	☐

Total Element Cost	**$726,822.35**
Total 1st Year Technology Cost	**$726,822.35**

Phase Technology Cost Detail Report
(with Markups)

Technology: Clear and Grub

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17010102	Selective clearing, brush, medium clearing, with dozer and brush rake, excludes removal offsite	8.67	ACR	0.00	93.91	105.25	$1,726.71	☐
17010211	Site clearing trees, with 335 H.P. dozer, to 12" diameter	867.00	EA	0.00	3.93	8.17	$10,493.73	☐
17010315	Grub stumps, with 335 H.P. dozer, to 12" diameter	867.00	EA	0.00	2.36	4.90	$6,296.24	☐
17010501	Grub and stack, 140 H.P. dozer	1,049.07	CY	0.00	2.36	1.62	$4,170.16	☐
17020401	Dump Charges	3,816.53	CY	19.31	0.00	0.00	$73,698.34	☑
17030224	966, 4.0 CY, Wheel Loader	23.00	HR	0.00	41.90	83.51	$2,884.49	☐
17030288	26 CY, Semi Dump	91.00	HR	0.00	34.91	78.99	$10,364.60	☐

Total Element Cost **$109,634.28**

Total 1st Year Technology Cost **$109,634.28**

Total Phase Cost **$1,833,876.47**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name: Alternative 3: Soil and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 soil caps, as specified in Figure 6-1, and the excavation and consolidation of 950 CY of soil. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:15:29 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@yahoo.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Soil cover construction
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: In Situ
Start Date: 1/1/2005

Media/Waste Type: Soil
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: System Defaults

Description: Construction of 4 soil covers as specified in Figure 6-1. Includes clearing and grubbing with offsite disposal.

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	1,496.76	CY	7.66	1.59	2.15	$17,076.68	☐
18050301	Loam or topsoil, imported topsoil, 6" deep, furnish and place	384.72	LCY	26.13	4.34	1.69	$12,371.44	☐
18050402	Seeding, Vegetative Cover	0.34	ACR	23,943.65	319.89	148.99	$8,300.26	☐
33080503	Polymeric Liner Anchor Trench, 3' x 1.5'	780.00	LF	0.04	1.55	0.30	$1,475.99	☐
33080507	Clay 10E-7, 6" Lifts, Off-Site	861.78	CY	9.64	2.86	3.39	$13,685.76	☐

Total Element Cost **$52,910.14**

Total 1st Year Technology Cost **$52,910.14**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	2,415.44	CY	7.66	1.59	2.15	$27,558.00	☐
18050301	Loam or topsoil, imported topsoil, 6" deep, furnish and place	687.96	LCY	26.13	4.34	1.69	$22,122.73	☐
18050402	Seeding, Vegetative Cover	0.66	ACR	23,943.65	319.89	148.99	$16,112.27	☐
33080503	Polymeric Liner Anchor Trench, 3' x 1.5'	799.37	LF	0.04	1.55	0.30	$1,512.65	☐
33080507	Clay 10E-7, 6" Lifts, Off-Site	1,541.03	CY	9.64	2.86	3.39	$24,472.79	☐

Total Element Cost **$91,778.44**

Total 1st Year Technology Cost **$91,778.44**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	8,809.34	CY	7.66	1.59	2.15	$100,506.64	☐
18050301	Loam or topsoil, imported topsoil, 6" deep, furnish and place	2,600.03	LCY	26.13	4.34	1.69	$83,609.17	☐
18050402	Seeding, Vegetative Cover	2.23	ACR	23,943.65	319.89	148.99	$54,439.95	☐
33080503	Polymeric Liner Anchor Trench, 3' x 1.5'	2,220.00	LF	0.04	1.55	0.30	$4,200.91	☐
33080507	Clay 10E-7, 6" Lifts, Off-Site	5,824.06	CY	9.64	2.86	3.39	$92,490.73	☐

Total Element Cost	**$335,247.39**
Total 1st Year Technology Cost	**$335,247.39**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	3,484.26	CY	7.66	1.59	2.15	$39,752.27	☐
18050301	Loam or topsoil, imported topsoil, 6" deep, furnish and place	1,000.93	LCY	26.13	4.34	1.69	$32,186.91	☐
18050402	Seeding, Vegetative Cover	0.92	ACR	23,943.65	319.89	148.99	$22,459.53	☐
33080503	Polymeric Liner Anchor Trench, 3' x 1.5'	1,080.00	LF	0.04	1.55	0.30	$2,043.68	☐
33080507	Clay 10E-7, 6" Lifts, Off-Site	2,242.07	CY	9.64	2.86	3.39	$35,605.87	☐

Total Element Cost **$132,048.26**

Total 1st Year Technology Cost **$132,048.26**

Phase Technology Cost Detail Report
(with Markups)

Technology: Clear and Grub

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17010102	Selective clearing, brush, medium clearing, with dozer and brush rake, excludes removal offsite	4.15	ACR	0.00	93.91	105.25	$826.51	☐
17010211	Site clearing trees, with 335 H.P. dozer, to 12" diameter	415.00	EA	0.00	3.93	8.17	$5,022.95	☐
17010315	Grub stumps, with 335 H.P. dozer, to 12" diameter	415.00	EA	0.00	2.36	4.90	$3,013.77	☐
17010501	Grub and stack, 140 H.P. dozer	502.15	CY	0.00	2.36	1.62	$1,996.10	☐
17020401	Dump Charges	1,826.83	CY	19.31	0.00	0.00	$35,276.63	☑
17030222	926, 2.0 CY, Wheel Loader	35.00	HR	0.00	41.90	49.06	$3,183.81	☐
17030287	20 CY, Semi Dump	72.00	HR	0.00	34.91	78.15	$8,140.29	☐

Total Element Cost **$57,460.06**

Total 1st Year Technology Cost **$57,460.06**

Phase Technology Cost Detail Report
(with Markups)

Technology: Operations and Maintenance

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
99020110	Annual Maintenance Materials and Labor	1.00	LS	0.00	0.00	0.00	$0.00	☐
			Total Element Cost				**$0.00**	

Element: Capping

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.34	ACR	521.41	109.91	152.02	$266.33	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	0.34	ACR	56.68	43.27	33.80	$45.47	☐
18050415	Mowing	1.36	ACR	0.00	243.07	0.00	$330.57	☐
			Total Element Cost				**$642.38**	

Phase Technology Cost Detail Report
(with Markups)

Element: Capping

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.66	ACR	521.41	109.91	152.02	$517.00	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	0.66	ACR	56.68	43.27	33.80	$88.27	☐
18050415	Mowing	2.64	ACR	0.00	243.07	0.00	$641.69	☐

Total Element Cost **$1,246.97**

Element: Capping

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	2.23	ACR	521.41	109.91	152.02	$1,746.84	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	2.23	ACR	56.68	43.27	33.80	$298.26	☐
18050415	Mowing	8.92	ACR	0.00	243.07	0.00	$2,168.15	☐

Total Element Cost **$4,213.25**

Phase Technology Cost Detail Report
(with Markups)

Element: Capping

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.92	ACR	521.41	109.91	152.02	$720.67	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	0.92	ACR	56.68	43.27	33.80	$123.05	☐
18050415	Mowing	3.68	ACR	0.00	243.07	0.00	$894.48	☐

Total Element Cost	**$1,738.20**
Total 1st Year Technology Cost	**$7,840.80**
Runtime Percent Cost Adjustment	**100%**
O & M Total Cost	**$7,840.80**
Total Phase Cost	**$677,285.09**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

---

Site

Name: Alternative 3: Soil and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 soil caps, as specified in Figure 6-1, and the excavation and consolidation of 950 CY of soil. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:14:00 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@yahoo.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com

Date Reviewed: 01/06/2005

Phase

Name:	Excavation and Fill	**Media/Waste Type:**	N/A
Type:	Remedial Action	**Secondary Media/Waste Type:**	N/A
Labor Rate Group:	System Labor Rate	**Contaminant:**	None
Analysis Rate Group:	System Analysis Rate	**Secondary Contaminant:**	None
Approach:	Ex Situ	**Markup Template:**	System Defaults
Start Date:	1/1/2005	**O&M Markup Template:**	N/A

Description: Excavation and fill of 950 CY of contamination and consolidation under Site 27 asphalt cap.

Phase Technology Cost Detail Report
(with Markups)

Technology: Excavation

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030277	Excavate and load, bank measure, medium material, 2 C.Y. bucket, hydraulic excavator	948.15	BCY	0.00	0.85	0.73	$1,496.94	☐
17030418	Delivered & Dumped, Backfill with Stone	237.04	BCY	33.98	0.76	1.27	$8,533.82	☐
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	1,195.19	CY	8.14	1.73	2.61	$14,910.71	☐
33170803	Spray washing, decontaminate heavy equipment, decontaminate heavy equipment	1.00	EA	0.00	407.33	0.00	$407.33	☐

Total Element Cost	**$25,348.80**
Total 1st Year Technology Cost	**$25,348.80**
Total Phase Cost	**$25,348.80**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name: Alternative 3: Soil and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 soil caps, as specified in Figure 6-1, and the excavation and consolidation of 950 CY of soil. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 11:14:44 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@yahoo.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Institutional Controls
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: None
Start Date: 1/1/2005
Description: Institutional controls used to maintain C/I status

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Phase Technology Cost Detail Report
(with Markups)

Technology: MEC Institutional Controls

Element: Planning

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	80.00	MI	0.16	0.00	0.00	$12.86	☐
33040927	UXO Senior Scientist	64.00	HR	0.00	80.94	0.00	$5,180.41	☐
33040929	UXO Word Processor	12.00	HR	0.00	27.39	0.00	$328.62	☐
33240101	Other Direct Costs	1.00	LS	75.31	0.00	0.00	$75.31	☑
				Total Element Cost			**$5,597.21**	

Element: Implementation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	80.00	MI	0.16	0.00	0.00	$12.86	☐
33040927	UXO Senior Scientist	196.00	HR	0.00	80.94	0.00	$15,865.00	☐
33240101	Other Direct Costs	1.00	LS	216.89	0.00	0.00	$216.89	☑
33990105	Letter/Brochure Printing and Distribution, per Page	100.00	EA	2.31	0.00	0.00	$230.53	☐
				Total Element Cost			**$16,325.29**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$21,922.50**
Total Phase Cost	**$21,922.50**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name: Alternative 3: Soil and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 soil caps, as specified in Figure 6-1, and the excavation and consolidation of 950 CY of soil. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:16:12 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@yahoo.com

Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com

Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group:
Analysis Rate Group:
Approach: None
Start Date: 1/1/2005
Description: This estimate was imported or upgraded from a previous version of RACER and contained no information in this Description field.

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Phase Technology Cost Detail Report
(with Markups)

Technology: Five-Year Review

Element: Document Review

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220105	Project Engineer	4.00	HR	0.00	100.61	0.00	$402.46	☐
33220108	Project Scientist	1.00	HR	0.00	116.47	0.00	$116.47	☐
33220109	Staff Scientist	3.00	HR	0.00	86.32	0.00	$258.96	☐
				Total Element Cost			**$777.88**	

Element: Interviews

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	10.00	HR	0.00	103.76	0.00	$1,037.56	☐
				Total Element Cost			**$1,037.56**	

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	5.00	HR	0.00	103.76	0.00	$518.78	☐
33220105	Project Engineer	6.00	HR	0.00	100.61	0.00	$603.68	☐
33220108	Project Scientist	6.00	HR	0.00	116.47	0.00	$698.79	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220109	Staff Scientist	6.00	HR	0.00	86.32	0.00	$517.91	☐

Total Element Cost **$2,339.17**

Element: Report

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	12.00	HR	0.00	103.76	0.00	$1,245.07	☐
33220105	Project Engineer	31.00	HR	0.00	100.61	0.00	$3,119.04	☐
33220108	Project Scientist	25.00	HR	0.00	116.47	0.00	$2,911.63	☐
33220109	Staff Scientist	50.00	HR	0.00	86.32	0.00	$4,315.94	☐

Total Element Cost **$11,591.68**

Element: Travel

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010108	Sedan, Automobile, Rental	2.00	DAY	69.41	0.00	0.00	$138.83	☐
33010202	Sample collection, sampling personnel travel, per diem	2.00	DAY	120.00	0.00	0.00	$240.00	☑
33041101	Airfare	1.00	LS	500.00	0.00	0.00	$500.00	☑

Phase Technology Cost Detail Report
(with Markups)

Total Element Cost	**$878.83**
Total 1st Year Technology Cost	**$16,625.11**
Total Phase Cost	**$16,625.11**

Phase Cost Summary Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Soil
ID:	NAS Pensacola OU 2 Feasibility Study
Location:	PENSACOLA NAS, FLORIDA
Modifiers:	**Material** 1.005
	Labor 0.7
	Equipment 0.913
Category:	None
Report Option:	Fiscal Year
Description:	Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name:	Alternative 3: Soil and Asphalt Capping
ID:	NAS Pensacola OU 2 Feasibility Study
Type:	None
Description:	Includes the construction of 4 asphalt caps and 4 soil caps, as specified in Figure 6-1, and the excavation and consolidation of 950 CY of soil. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program:	Superfund Remedial

Estimator Information:

Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@yahoo.com

Prepared Date:	11/09/2004

Reviewer Information:

Phase Cost Summary Report
(with Markups)

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Design
Type: Design
Start Date: 1/1/2005
Description: Design of asphalt and soil covers and specification of excavation and consolidation activities.

Phase Cost Summary Report
(with Markups)

Phase Name	Phase	Approach	Capital Costs	Design %	RD Cost
Institutional Controls	Remedial Action	None	$21,923	0%	$0
Soil cover construction	Remedial Action	In Situ Containment	$669,443	5%	$33,472
Asphalt Cap Construction	Remedial Action	In Situ Containment	$1,833,878	3%	$55,016
Excavation and Fill	Remedial Action	Ex Situ Removal - Detailed Design On-site Treatment or Disposal	$25,349	13%	$3,295

Total Phase Cost	$91,783
Escalation	$0
Escalated Phase Cost	$91,783

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:12:16 AM

Cost Estimates for

Remedial Action Alternatives for Soil Contamination at OU 2

Alternative 4

Phytoremediation Covers and Asphalt Capping

Subsections:

Site cost over time and present value
Phase technology cost detail for asphalt caps
Phase technology cost detail for phytoremediation covers
Phase technology cost detail for O&M
Phase technology cost detail for excavation
Phase technology cost detail for institutional controls
Phase technology cost detail for 5-year reviews
Phase cost summary for design

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: Phyto Covers and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	**Reviewer**
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/9/2004	1/6/2005

Phase	**Phase Name**	**Fiscal Year 1 2005**	**Fiscal Year 2 2006**	**Fiscal Year 3 2007**	**Fiscal Year 4 2008**
Design	Design	$84,299			
Remedial Action	Phytoremediation cover construction & operation	$138,054	$31,412	$31,412	$31,412
Remedial Action	Institutional Controls (Capital)	$21,923			
Remedial Action	Asphalt Cap Construction (Capital)	$1,833,878			
Remedial Action	Excavation and Fill (Capital)	$25,349			
Operations & Maintenance	O&M	$13,993	$18,736	$18,658	$18,736
Long Term Monitoring	LTM				
Sub-Total		$2,117,496	$50,148	$50,070	$50,148
Escalation Factor		1.0000	1.0150	1.0323	1.0519
Total		$2,117,496	$50,900	$51,687	$52,750
		2005	**2006**	**2007**	**2008**
Discount Rate	6.0%				
Present Value	2005	$2,117,496	$48,019	$46,001	$44,290

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/17/2005
Time: 1:04 PM

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: Phyto Covers and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator	
Name:	Alan Noell, Ph.D., P.E.	
Title:	Senior Environmental Engineer	
Agency/Org./Office:	EnSafe Inc.	
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	
Phone:	972-791-3222	
Email:	anoell@ensafe.com	
Prepared Date:		11/9/2004

Phase	**Phase Name**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**
Design	Design				
Remedial Action	Phytoremediation cover construction & operation	$31,412	$31,412	$31,412	$31,412
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Operations & Maintenance	O&M	$18,971	$18,658	$18,736	$18,658
Long Term Monitoring	LTM		$16,625		
Sub-Total		$50,383	$66,695	$50,148	$50,070
Escalation Factor		1.0729	1.0944	1.1163	1.1386
Total		$54,055	$72,990	$55,980	$57,009
		2009	**2010**	**2011**	**2012**
Discount Rate	6.0%				
Present Value	2005	$42,817	$54,543	$39,463	$37,914

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: Phyto Covers and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 9 2013**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**
Design	Design				
Remedial Action	Phytoremediation cover construction & operation	$31,412	$31,412	$31,412	$31,412
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Operations & Maintenance	O&M	$18,736	$19,362	$4,664	
Long Term Monitoring	LTM			$16,625	
Sub-Total		$50,148	$50,774	$52,701	$31,412
Escalation Factor		1.1613	1.1846	1.2083	1.2324
Total		$58,236	$60,146	$63,679	$38,712
		2013	**2014**	**2015**	**2016**
Discount Rate	6.0%				
Present Value	2005	$36,538	$35,600	$35,558	$20,393

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: Phyto Covers and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 13 2017**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**	**Fiscal Year 16 2020**
Design	Design				
Remedial Action	Phytoremediation cover construction & operation	$31,412	$31,412	$31,412	$31,412
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Operations & Maintenance	O&M				
Long Term Monitoring	LTM				$16,625
Sub-Total		$31,412	$31,412	$31,412	$48,037
Escalation Factor		1.2571	1.2822	1.3079	1.3340
Total		$39,488	$40,276	$41,083	$64,081
		2017	**2018**	**2019**	**2020**
Discount Rate	6.0%				
Present Value	2005	$19,624	$18,883	$18,171	$26,739

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/17/2005
Time: 1:04 PM

This report is for official U.S. Government use only.

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: Phyto Covers and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 17 2021**	**Fiscal Year 18 2022**	**Fiscal Year 19 2023**	**Fiscal Year 20 2024**
Design	Design				
Remedial Action	Phytoremediation cover construction & operation	$31,412	$31,412	$31,412	$31,412
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Operations & Maintenance	O&M				
Long Term Monitoring	LTM				
Sub-Total		$31,412	$31,412	$31,412	$31,412
Escalation Factor		1.3607	1.3879	1.4157	1.4440
Total		$42,742	$43,596	$44,469	$45,358
		2021	**2022**	**2023**	**2024**
Discount Rate	6.0%				
Present Value	2005	$16,825	$16,190	$15,580	$14,992

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/17/2005
Time: 1:04 PM

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: Phyto Covers and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 21 2025**	**Fiscal Year 22 2026**	**Fiscal Year 23 2027**	**Fiscal Year 24 2028**
Design	Design				
Remedial Action	Phytoremediation cover construction & operation	$31,412	$31,412	$31,412	$31,412
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Operations & Maintenance	O&M				
Long Term Monitoring	LTM	$16,625			
Sub-Total		$48,037	$31,412	$31,412	$31,412
Escalation Factor		1.4729	1.5023	1.5324	1.5630
Total		$70,753	$47,190	$48,135	$49,096
		2025	**2026**	**2027**	**2028**
Discount Rate	6.0%				
Present Value	2005	$22,061	$13,881	$13,358	$12,853

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: Phyto Covers and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**	**Fiscal Year 28 2032**
Design	Design				
Remedial Action	Phytoremediation cover construction & operation	$31,412	$31,412	$31,412	$31,412
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Asphalt Cap Construction (Capital)				
Remedial Action	Excavation and Fill (Capital)				
Operations & Maintenance	O&M				
Long Term Monitoring	LTM		$16,625		
Sub-Total		$31,412	$48,037	$31,412	$31,412
Escalation Factor		1.5943	1.6262	1.6587	1.6919
Total		$50,080	$78,117	$52,102	$53,145
		2029	**2030**	**2031**	**2032**
Discount Rate	6.0%				
Present Value	2005	$12,369	$18,201	$11,453	$11,021

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: Phyto Covers and Asphalt Capping
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**	**Fiscal Year 31 2035**	**Row Total**
Design	Design				$84,299
Remedial Action	Phytoremediation cover construction & operation	$31,412	$31,412	$2,705	$1,051,707
Remedial Action	Institutional Controls (Capital)				$21,923
Remedial Action	Asphalt Cap Construction (Capital)				$1,833,878
Remedial Action	Excavation and Fill (Capital)				$25,349
Operations & Maintenance	O&M				$187,908
Long Term Monitoring	LTM			$16,625	$99,750
Sub-Total		$31,412	$31,412	$19,330	$3,304,814
Escalation Factor		1.7257	1.7602	1.7954	
Total		$54,207	$55,291	$34,705	$3,687,556
		2033	**2034**	**2035**	
Discount Rate	6.0%				
Present Value	2005	$10,605	$10,204	$6,043	$2,847,683

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

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Site

Name: Alternative 4: Phyto Covers and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 phytoremediation covers, as specified in Figure 6-2, and the excavation and consolidation of 950 CY of soil. Includes O&M and natural attenuation monitoring of phytoremediation covers for 10 years. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230

Phase Technology Cost Detail Report
(with Markups)

Irving, TX 75038

Phone: 972-791-3222

Email: anoell@yahoo.com

Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.

Title: Geologist

Agency/Org./Office: EnSafe Inc.

Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134

Phone: 901-372-7962

Email: bbrantley@ensafe.com

Date Reviewed: 01/06/2005

Phase

Name: Asphalt Cap Construction

Type: Remedial Action

Labor Rate Group: System Labor Rate

Analysis Rate Group: System Analysis Rate

Approach: In Situ

Start Date: 1/1/2005

Media/Waste Type: Soil

Secondary Media/Waste Type: N/A

Contaminant: None

Secondary Contaminant: None

Markup Template: System Defaults

O&M Markup Template: N/A

Description: Construction 4 asphalt caps as specified on Figure 6-1. Includes clearing and grubbing with offsite disposal.

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	3,895.84	CY	7.66	1.59	2.15	$44,448.03	☐
18010102	Gravel, Delivered & Dumped	6,545.02	CY	26.67	2.32	1.89	$202,074.88	☐
18010330	Hydraulic Asphalt Concrete	18,700.05	SY	21.79	0.00	0.00	$407,490.94	☐
33080535	16 oz/sy Geotextile/Drainage Fabric (170 Mil)	41,140.11	SY	2.07	0.91	0.05	$124,827.32	☐

Total Element Cost **$778,841.16**

Total 1st Year Technology Cost **$778,841.16**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	256.65	CY	7.66	1.59	2.15	$2,928.15	☐
18010102	Gravel, Delivered & Dumped	431.17	CY	26.67	2.32	1.89	$13,312.20	☐
18010330	Hydraulic Asphalt Concrete	1,231.92	SY	21.79	0.00	0.00	$26,844.65	☐
33080535	16 oz/sy Geotextile/Drainage Fabric (170 Mil)	2,710.22	SY	2.07	0.91	0.05	$8,223.35	☐

Total Element Cost **$51,308.34**

Total 1st Year Technology Cost **$51,308.34**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	836.70	CY	7.66	1.59	2.15	$9,545.99	☐
18010102	Gravel, Delivered & Dumped	1,405.66	CY	26.67	2.32	1.89	$43,399.19	☐
18010330	Hydraulic Asphalt Concrete	4,016.18	SY	21.79	0.00	0.00	$87,516.18	☐
33080535	16 oz/sy Geotextile/Drainage Fabric (170 Mil)	8,835.60	SY	2.07	0.91	0.05	$26,808.98	☐

Total Element Cost	**$167,270.34**
Total 1st Year Technology Cost	**$167,270.34**

Phase Technology Cost Detail Report
(with Markups)

Technology: Capping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	3,635.64	CY	7.66	1.59	2.15	$41,479.38	☐
18010102	Gravel, Delivered & Dumped	6,107.88	CY	26.67	2.32	1.89	$188,578.35	☐
18010330	Hydraulic Asphalt Concrete	17,451.07	SY	21.79	0.00	0.00	$380,274.53	☐
33080535	16 oz/sy Geotextile/Drainage Fabric (170 Mil)	38,392.36	SY	2.07	0.91	0.05	$116,490.10	☐

Total Element Cost **$726,822.35**

Total 1st Year Technology Cost **$726,822.35**

Phase Technology Cost Detail Report
(with Markups)

Technology: Clear and Grub

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17010102	Selective clearing, brush, medium clearing, with dozer and brush rake, excludes removal offsite	8.67	ACR	0.00	93.91	105.25	$1,726.71	☐
17010211	Site clearing trees, with 335 H.P. dozer, to 12" diameter	867.00	EA	0.00	3.93	8.17	$10,493.73	☐
17010315	Grub stumps, with 335 H.P. dozer, to 12" diameter	867.00	EA	0.00	2.36	4.90	$6,296.24	☐
17010501	Grub and stack, 140 H.P. dozer	1,049.07	CY	0.00	2.36	1.62	$4,170.16	☐
17020401	Dump Charges	3,816.53	CY	19.31	0.00	0.00	$73,698.34	☑
17030224	966, 4.0 CY, Wheel Loader	23.00	HR	0.00	41.90	83.51	$2,884.49	☐
17030288	26 CY, Semi Dump	91.00	HR	0.00	34.91	78.99	$10,364.60	☐

Total Element Cost	**$109,634.28**
Total 1st Year Technology Cost	**$109,634.28**
Total Phase Cost	**$1,833,876.47**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

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Site

Name: Alternative 4: Phyto Covers and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 phytoremediation covers, as specified in Figure 6-2, and the excavation and consolidation of 950 CY of soil. Includes O&M and natural attenuation monitoring of phytoremediation covers for 10 years. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230

	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@yahoo.com
Prepared Date:	11/09/2004

Reviewer Information:

Name:	Ben Brantley, P.G.
Title:	Geologist
Agency/Org./Office:	EnSafe Inc.
Business Address:	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	901-372-7962
Email:	bbrantley@ensafe.com
Date Reviewed:	01/06/2005

Phase

Name:	Phytoremediation cover construction & operation	**Media/Waste Type:**	N/A
Type:	Remedial Action	**Secondary Media/Waste Type:**	N/A
Labor Rate Group:	System Labor Rate	**Contaminant:**	None
Analysis Rate Group:	System Analysis Rate	**Secondary Contaminant:**	None
Approach:	Ex Situ	**Markup Template:**	System Defaults
Start Date:	1/1/2005	**O&M Markup Template:**	System Defaults

Description: Construction of 4 phytoremediation covers, as specified in Figure 6-2. Includes clearing and grubbing with offsite disposal and natural attenuation monitoring for 10 years.

Phase Technology Cost Detail Report
(with Markups)

Technology: Phytoremediation

Element: SOIL

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050701	Full Circle Sprinkler Head, 30' Diameter	4.00	EA	24.54	49.15	0.00	$294.75	☐
19040423	1,000 Gallon Nalgene Horizontal XLPE Tank without legs	1.00	EA	2,356.22	0.00	0.00	$2,356.22	☐
33010509	Portable Water Pump, 2", 10,000 GPH, Gas Powered, with Wheels	1.00	EA	1,771.35	320.98	0.00	$2,092.33	☐
33029928	Utilities Hook-up Fee	1.00	EA	3,152.13	0.00	0.00	$3,152.13	☐
33111037	Phytoremediation Grass (General Cost)	1,667.00	SY	0.18	0.08	0.00	$426.92	☐
33260550	2" Polyethylene, flexible piping, SDR15, 125 psi	173.00	LF	1.63	0.00	0.00	$281.87	☐

Total Element Cost **$8,604.21**

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010105	Sample collection, vehicle mileage charge, pickup truck	40.00	MI	0.26	0.00	0.00	$10.45	☐

Total Element Cost **$10.45**

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$8,614.67**

Phase Technology Cost Detail Report
(with Markups)

Technology: Phytoremediation

Element: SOIL

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050701	Full Circle Sprinkler Head, 30' Diameter	7.00	EA	24.54	49.15	0.00	$515.81	☐
19040423	1,000 Gallon Nalgene Horizontal XLPE Tank without legs	1.00	EA	2,356.22	0.00	0.00	$2,356.22	☐
33010509	Portable Water Pump, 2", 10,000 GPH, Gas Powered, with Wheels	1.00	EA	1,771.35	320.98	0.00	$2,092.33	☐
33029928	Utilities Hook-up Fee	1.00	EA	3,152.13	0.00	0.00	$3,152.13	☐
33111037	Phytoremediation Grass (General Cost)	3,200.00	SY	0.18	0.08	0.00	$819.52	☐
33260550	2" Polyethylene, flexible piping, SDR15, 125 psi	331.00	LF	1.63	0.00	0.00	$539.30	☐
				Total Element Cost			**$9,475.31**	

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010105	Sample collection, vehicle mileage charge, pickup truck	40.00	MI	0.26	0.00	0.00	$10.45	☐
				Total Element Cost			**$10.45**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$9,485.76**

Phase Technology Cost Detail Report
(with Markups)

Technology: Phytoremediation

Element: SOIL

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050701	Full Circle Sprinkler Head, 30' Diameter	23.00	EA	24.54	49.15	0.00	$1,694.81	☐
19040423	1,000 Gallon Nalgene Horizontal XLPE Tank without legs	1.00	EA	2,356.22	0.00	0.00	$2,356.22	☐
33010114	Mobilization Equipment (Soils)	1.00	LS	3,605.89	0.00	0.00	$3,605.89	☐
33010115	Demobilize Equipment (Soils)	1.00	LS	3,605.89	0.00	0.00	$3,605.89	☐
33010509	Portable Water Pump, 2", 10,000 GPH, Gas Powered, with Wheels	1.00	EA	1,771.35	320.98	0.00	$2,092.33	☐
33029928	Utilities Hook-up Fee	1.00	EA	3,152.13	0.00	0.00	$3,152.13	☐
33111037	Phytoremediation Grass (General Cost)	10,778.00	SY	0.18	0.08	0.00	$2,760.25	☐
33260550	2" Polyethylene, flexible piping, SDR15, 125 psi	1,114.00	LF	1.63	0.00	0.00	$1,815.04	☐

Total Element Cost **$21,082.56**

Phase Technology Cost Detail Report
(with Markups)

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010105	Sample collection, vehicle mileage charge, pickup truck	40.00	MI	0.26	0.00	0.00	$10.45	☐

Total Element Cost	**$10.45**
Total 1st Year Technology Cost	**$21,093.02**

Phase Technology Cost Detail Report
(with Markups)

Technology: Phytoremediation

Element: SOIL

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050701	Full Circle Sprinkler Head, 30' Diameter	10.00	EA	24.54	49.15	0.00	$736.88	☐
19040423	1,000 Gallon Nalgene Horizontal XLPE Tank without legs	1.00	EA	2,356.22	0.00	0.00	$2,356.22	☐
33010509	Portable Water Pump, 2", 10,000 GPH, Gas Powered, with Wheels	1.00	EA	1,771.35	320.98	0.00	$2,092.33	☐
33029928	Utilities Hook-up Fee	1.00	EA	3,152.13	0.00	0.00	$3,152.13	☐
33111037	Phytoremediation Grass (General Cost)	4,445.00	SY	0.18	0.08	0.00	$1,138.36	☐
33260550	2" Polyethylene, flexible piping, SDR15, 125 psi	460.00	LF	1.63	0.00	0.00	$749.48	☐
				Total Element Cost			**$10,225.39**	

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010105	Sample collection, vehicle mileage charge, pickup truck	40.00	MI	0.26	0.00	0.00	$10.45	☐
				Total Element Cost			**$10.45**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$10,235.85**

Phase Technology Cost Detail Report
(with Markups)

Technology: Natural Attenuation

Element: General

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	40.00	MI	0.16	0.00	0.00	$6.43	☐
33220102	Project Manager	4.00	HR	0.00	97.39	0.00	$389.54	☐
33220105	Project Engineer	30.00	HR	0.00	94.44	0.00	$2,833.08	☐
33220108	Project Scientist	60.00	HR	0.00	109.31	0.00	$6,558.82	☐
33220109	Staff Scientist	81.00	HR	0.00	81.02	0.00	$6,562.50	☐
33220112	Field Technician	4.00	HR	0.00	60.36	0.00	$241.43	☐
33220114	Word Processing/Clerical	15.00	HR	0.00	42.05	0.00	$630.70	☐
33220115	Draftsman/CADD	11.00	HR	0.00	54.97	0.00	$604.65	☐
				Total Element Cost			**$17,827.16**	

Element: Surface Soil

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020603	Surface Soil Sampling Equipment	1.00	EA	491.38	0.00	0.00	$491.38	☐
33021102	Testing, moisture content (209a)	6.00	EA	30.91	0.00	0.00	$185.43	☐
33021720	Testing, purgeable organics (624, 8260)	6.00	EA	184.76	0.00	0.00	$1,108.54	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Surface Soil

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33021742	Testing, soil & sediment analysis, sulfates (375.3m)	6.00	EA	23.11	0.00	0.00	$138.66	☐
33021743	Testing, sulfur: sulfate, sulfide, sulfite	6.00	EA	37.08	0.00	0.00	$222.49	☐
33021744	Testing, soil & sediment analysis, pH, electrometric (9045)	6.00	EA	8.89	0.00	0.00	$53.31	☐
33021746	Testing, soil & sediment analysis, total organic carbon (16.3)	6.00	EA	33.93	0.00	0.00	$203.60	☐
33021753	Testing, soil & sediment analysis, nitrogen, nitrate/nitrite (353.3)	6.00	EA	33.60	0.00	0.00	$201.61	☐
33021754	Testing, soil & sediment analysis, chloride, titrimetric (9252)	6.00	EA	26.56	0.00	0.00	$159.38	☐

Total Element Cost **$2,764.41**

Total 1st Year Technology Cost **$20,591.57**

Phase Technology Cost Detail Report
(with Markups)

Technology: Clear and Grub

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17010102	Selective clearing, brush, medium clearing, with dozer and brush rake, excludes removal offsite	4.15	ACR	0.00	98.67	113.56	$880.76	☐
17010211	Site clearing trees, with 335 H.P. dozer, to 12" diameter	415.00	EA	0.00	4.13	8.82	$5,373.50	☐
17010315	Grub stumps, with 335 H.P. dozer, to 12" diameter	415.00	EA	0.00	2.48	5.29	$3,224.09	☐
17010501	Grub and stack, 140 H.P. dozer	502.15	CY	0.00	2.48	1.74	$2,120.28	☐
17020401	Dump Charges	1,826.83	CY	19.82	0.00	0.00	$36,213.07	☑
17030222	926, 2.0 CY, Wheel Loader	35.00	HR	0.00	44.03	52.94	$3,393.77	☐
17030287	20 CY, Semi Dump	72.00	HR	0.00	36.68	84.32	$8,712.02	☐

Total Element Cost **$59,917.50**

Total 1st Year Technology Cost **$59,917.50**

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:32:51 AM

Phase Technology Cost Detail Report
(with Markups)

Technology: Operations and Maintenance

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
99020110	Annual Maintenance Materials and Labor	1.00	LS	0.00	0.00	0.00	$0.00	☐

Total Element Cost **$0.00**

Element: Phytoremediation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.34	ACR	521.41	109.91	152.02	$266.33	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	0.34	ACR	56.68	43.27	33.80	$45.47	☐
18050415	Mowing	1.36	ACR	0.00	243.07	0.00	$330.57	☐

Total Element Cost **$642.38**

Phase Technology Cost Detail Report
(with Markups)

Element: Phytoremediation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.66	ACR	521.41	109.91	152.02	$517.00	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	0.66	ACR	56.68	43.27	33.80	$88.27	☐
18050415	Mowing	2.64	ACR	0.00	243.07	0.00	$641.69	☐
				Total Element Cost			**$1,246.97**	

Element: Phytoremediation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	2.23	ACR	521.41	109.91	152.02	$1,746.84	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	2.23	ACR	56.68	43.27	33.80	$298.26	☐
18050415	Mowing	8.92	ACR	0.00	243.07	0.00	$2,168.15	☐
				Total Element Cost			**$4,213.25**	

Phase Technology Cost Detail Report
(with Markups)

Element: Phytoremediation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.92	ACR	521.41	109.91	152.02	$720.67	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	0.92	ACR	56.68	43.27	33.80	$123.05	☐
18050415	Mowing	3.68	ACR	0.00	243.07	0.00	$894.48	☐

Total Element Cost	**$1,738.20**
Total 1st Year Technology Cost	**$7,840.80**
Runtime Percent Cost Adjustment	**100%**
O & M Total Cost	**$7,840.80**
Total Phase Cost	**$137,779.17**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

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Site

Name: Alternative 4: Phyto Covers and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 phytoremediation covers, as specified in Figure 6-2, and the excavation and consolidation of 950 CY of soil. Includes O&M and natural attenuation monitoring of phytoremediation covers for 10 years. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:33:43 AM

Phase Technology Cost Detail Report
(with Markups)

	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@yahoo.com
Prepared Date:	11/09/2004

Reviewer Information:

Name:	Ben Brantley, P.G.
Title:	Geologist
Agency/Org./Office:	EnSafe Inc.
Business Address:	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	901-372-7962
Email:	bbrantley@ensafe.com
Date Reviewed:	01/06/2005

Phase

Name:	O&M	**Media/Waste Type:**	N/A
Type:	Operations & Maintenance	**Secondary Media/Waste Type:**	N/A
Labor Rate Group:	System Labor Rate	**Contaminant:**	None
Analysis Rate Group:	System Analysis Rate	**Secondary Contaminant:**	None
Approach:	Ex Situ	**Markup Template:**	System Defaults
Start Date:	1/1/2005	**O&M Markup Template:**	System Defaults

Description: Includes operations of phytoremediation covers for 10 years. Specific tasks include irrigation and nutrient amendment, replanting, inspection, and mowing/maintenance.

Phase Technology Cost Detail Report
(with Markups)

Technology: Operations and Maintenance

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010202	Sample collection, sampling personnel travel, per diem	96.00	DAY	120.00	0.00	0.00	$11,520.00	☑
33010206	Mobilize Crew, Local, per Person	12.00	EA	54.34	0.00	0.00	$652.11	☐
33010423	Disposable Gloves (Latex)	17.00	PR	0.28	0.00	0.00	$4.70	☐
33010425	Disposable Coveralls (Tyvek)	17.00	EA	6.24	0.00	0.00	$106.08	☐
99020110	Annual Maintenance Materials and Labor	1.00	LS	43.22	54.03	24.85	$122.10	☑

Total Element Cost **$12,404.99**

Element: Phytoremediation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.02	ACR	500.56	106.36	141.74	$14.97	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	1.00	ACR	54.41	41.87	31.52	$127.80	☐
18050415	Mowing	1.00	ACR	0.00	235.23	0.00	$235.23	☐
33220106	Staff Engineer	3.00	HR	0.00	84.96	0.00	$254.87	☐
33220112	Field Technician	13.00	HR	0.00	62.05	0.00	$806.66	☐

Phase Technology Cost Detail Report
(with Markups)

	Total Element Cost	**$1,439.54**

Element: Phytoremediation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.03	ACR	500.56	106.36	141.74	$22.46	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	1.00	ACR	54.41	41.87	31.52	$127.80	☐
18050415	Mowing	1.00	ACR	0.00	235.23	0.00	$235.23	☐
33220106	Staff Engineer	3.00	HR	0.00	84.96	0.00	$254.87	☐
33220112	Field Technician	14.00	HR	0.00	62.05	0.00	$868.71	☐

	Total Element Cost	**$1,509.08**

Element: Phytoremediation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.11	ACR	500.56	106.36	141.74	$82.35	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	3.00	ACR	54.41	41.87	31.52	$383.41	☐
18050415	Mowing	3.00	ACR	0.00	235.23	0.00	$705.68	☐
33220106	Staff Engineer	3.00	HR	0.00	84.96	0.00	$254.87	☐
33220112	Field Technician	15.00	HR	0.00	62.05	0.00	$930.77	☐

Phase Technology Cost Detail Report
(with Markups)

Total Element Cost	**$2,357.07**

Element: Phytoremediation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18050401	Seeding, 67% Level & 33% Slope, Hydroseeding	0.05	ACR	500.56	106.36	141.74	$37.43	☐
18050409	Fertilize, 800 Lbs/Acre, Push Rotary	1.00	ACR	54.41	41.87	31.52	$127.80	☐
18050415	Mowing	1.00	ACR	0.00	235.23	0.00	$235.23	☐
33220106	Staff Engineer	3.00	HR	0.00	84.96	0.00	$254.87	☐
33220112	Field Technician	14.00	HR	0.00	62.05	0.00	$868.71	☐

Total Element Cost	**$1,524.05**
Total 1st Year Technology Cost	**$19,234.73**
Runtime Percent Cost Adjustment	**97%**
O & M Total Cost	**$18,657.69**
Total Phase Cost	**$18,657.69**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

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Site

Name: Alternative 4: Phyto Covers and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 phytoremediation covers, as specified in Figure 6-2, and the excavation and consolidation of 950 CY of soil. Includes O&M and natural attenuation monitoring of phytoremediation covers for 10 years. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230

Cost Database Date: 2005
Cost Type: User-Defined

Print Date: 1/11/2005 11:20:50 AM

Phase Technology Cost Detail Report
(with Markups)

	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@yahoo.com
Prepared Date:	11/09/2004

Reviewer Information:

Name:	Ben Brantley, P.G.
Title:	Geologist
Agency/Org./Office:	EnSafe Inc.
Business Address:	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	901-372-7962
Email:	bbrantley@ensafe.com
Date Reviewed:	01/06/2005

Phase

Name:	Excavation and Fill	**Media/Waste Type:**	N/A
Type:	Remedial Action	**Secondary Media/Waste Type:**	N/A
Labor Rate Group:	System Labor Rate	**Contaminant:**	None
Analysis Rate Group:	System Analysis Rate	**Secondary Contaminant:**	None
Approach:	Ex Situ	**Markup Template:**	System Defaults
Start Date:	1/1/2005	**O&M Markup Template:**	N/A

Description: Excavation and fill of 950 CY of contamination and consolidation under Site 27 asphalt cap.

Phase Technology Cost Detail Report
(with Markups)

Technology: Excavation

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030277	Excavate and load, bank measure, medium material, 2 C.Y. bucket, hydraulic excavator	948.15	BCY	0.00	0.85	0.73	$1,496.94	☐
17030418	Delivered & Dumped, Backfill with Stone	237.04	BCY	33.98	0.76	1.27	$8,533.82	☐
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	1,195.19	CY	8.14	1.73	2.61	$14,910.71	☐
33170803	Spray washing, decontaminate heavy equipment, decontaminate heavy equipment	1.00	EA	0.00	407.33	0.00	$407.33	☐

Total Element Cost	**$25,348.80**
Total 1st Year Technology Cost	**$25,348.80**
Total Phase Cost	**$25,348.80**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name: Alternative 4: Phyto Covers and Asphalt Capping
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the construction of 4 asphalt caps and 4 phytoremediation covers, as specified in Figure 6-2, and the excavation and consolidation of 950 CY of soil. Includes O&M and natural attenuation monitoring of phytoremediation covers for 10 years. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 11:21:28 AM

Phase Technology Cost Detail Report
(with Markups)

Irving, TX 75038
Phone: 972-791-3222
Email: anoell@yahoo.com

Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com

Date Reviewed: 01/06/2005

Phase

Name: Institutional Controls
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: None
Start Date: 1/1/2005
Description: Institutional controls used to maintain C/I status

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Phase Technology Cost Detail Report
(with Markups)

Technology: MEC Institutional Controls

Element: Planning

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	80.00	MI	0.16	0.00	0.00	$12.86	☐
33040927	UXO Senior Scientist	64.00	HR	0.00	80.94	0.00	$5,180.41	☐
33040929	UXO Word Processor	12.00	HR	0.00	27.39	0.00	$328.62	☐
33240101	Other Direct Costs	1.00	LS	75.31	0.00	0.00	$75.31	☑
				Total Element Cost			**$5,597.21**	

Element: Implementation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	80.00	MI	0.16	0.00	0.00	$12.86	☐
33040927	UXO Senior Scientist	196.00	HR	0.00	80.94	0.00	$15,865.00	☐
33240101	Other Direct Costs	1.00	LS	216.89	0.00	0.00	$216.89	☑
33990105	Letter/Brochure Printing and Distribution, per Page	100.00	EA	2.31	0.00	0.00	$230.53	☐
				Total Element Cost			**$16,325.29**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$21,922.50**
Total Phase Cost	**$21,922.50**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Soil	
ID:	NAS Pensacola OU 2 Feasibility Study	
Location:	PENSACOLA NAS, FLORIDA	
Modifiers:	**Material**	1.005
	Labor	0.7
	Equipment	0.913
Category:	None	
Report Option:	Fiscal Year	
Description:	Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances	

Site

Name: Alternative 4: Phyto Covers and Asphalt Capping

ID: NAS Pensacola OU 2 Feasibility Study

Type: None

Description: Includes the construction of 4 asphalt caps and 4 phytoremediation covers, as specified in Figure 6-2, and the excavation and consolidation of 950 CY of soil. Includes O&M and natural attenuation monitoring of phytoremediation covers for 10 years. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.

Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.

Title: Senior Environmental Engineer

Agency/Org./Office: EnSafe Inc.

Business Address: 4545 Fuller Drive, Suite 230

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:34:24 AM

Irving, TX 75038
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Email: anoell@yahoo.com

Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com

Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group:
Analysis Rate Group:
Approach: Ex Situ
Start Date: 1/1/2005

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Description: This estimate was imported or upgraded from a previous version of RACER and contained no information in this Description field.

Phase Technology Cost Detail Report
(with Markups)

Technology: Five-Year Review

Element: Document Review

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220105	Project Engineer	4.00	HR	0.00	100.61	0.00	$402.46	☐
33220108	Project Scientist	1.00	HR	0.00	116.47	0.00	$116.47	☐
33220109	Staff Scientist	3.00	HR	0.00	86.32	0.00	$258.96	☐
				Total Element Cost			**$777.88**	

Element: Interviews

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	10.00	HR	0.00	103.76	0.00	$1,037.56	☐
				Total Element Cost			**$1,037.56**	

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	5.00	HR	0.00	103.76	0.00	$518.78	☐
33220105	Project Engineer	6.00	HR	0.00	100.61	0.00	$603.68	☐
33220108	Project Scientist	6.00	HR	0.00	116.47	0.00	$698.79	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220109	Staff Scientist	6.00	HR	0.00	86.32	0.00	$517.91	☐

Total Element Cost **$2,339.17**

Element: Report

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	12.00	HR	0.00	103.76	0.00	$1,245.07	☐
33220105	Project Engineer	31.00	HR	0.00	100.61	0.00	$3,119.04	☐
33220108	Project Scientist	25.00	HR	0.00	116.47	0.00	$2,911.63	☐
33220109	Staff Scientist	50.00	HR	0.00	86.32	0.00	$4,315.94	☐

Total Element Cost **$11,591.68**

Element: Travel

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010108	Sedan, Automobile, Rental	2.00	DAY	69.41	0.00	0.00	$138.83	☐
33010202	Sample collection, sampling personnel travel, per diem	2.00	DAY	120.00	0.00	0.00	$240.00	☑
33041101	Airfare	1.00	LS	500.00	0.00	0.00	$500.00	☑

Phase Technology Cost Detail Report
(with Markups)

Total Element Cost	**$878.83**
Total 1st Year Technology Cost	**$16,625.11**
Total Phase Cost	**$16,625.11**

Phase Cost Summary Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Soil		
ID:	NAS Pensacola OU 2 Feasibility Study		
Location:	PENSACOLA NAS, FLORIDA		
Modifiers:	**Material**	1.005	
	Labor	0.7	
	Equipment	0.913	
Category:	None		
Report Option:	Fiscal Year		
Description:	Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances		

Site

Name: Alternative 4: Phyto Covers and Asphalt Capping

ID: NAS Pensacola OU 2 Feasibility Study

Type: None

Description: Includes the construction of 4 asphalt caps and 4 phytoremediation covers, as specified in Figure 6-2, and the excavation and consolidation of 950 CY of soil. Includes O&M and natural attenuation monitoring of phytoremediation covers for 10 years. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.

Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.

Title: Senior Environmental Engineer

Agency/Org./Office: EnSafe Inc.

Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Phone: 972-791-3222

Email: anoell@yahoo.com

Prepared Date: 11/09/2004

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:19:26 AM

Phase Cost Summary Report
(with Markups)

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com

Date Reviewed: 01/06/2005

Phase

Name: Design
Type: Design
Start Date: 1/1/2005
Description: Design of asphalt and phytoremediation covers and specification of excavation and consolidation activities. Phytoremediation cover design includes pilot-testing activities.

Phase Cost Summary Report
(with Markups)

Phase Name	Phase	Approach	Capital Costs	Design %	RD Cost
Phytoremediation cover construction & operation	Remedial Action	Ex Situ Removal - Detailed Design On-site Treatment or Disposal	$129,939	20%	$25,988
Institutional Controls	Remedial Action	None	$21,923	0%	$0
Asphalt Cap Construction	Remedial Action	In Situ Containment	$1,833,878	3%	$55,016
Excavation and Fill	Remedial Action	Ex Situ Removal - Detailed Design On-site Treatment or Disposal	$25,349	13%	$3,295

Total Phase Cost	$84,299
Escalation	$0
Escalated Phase Cost	$84,299

Cost Estimates for

Remedial Action Alternatives for Soil Contamination at OU 2

Alternative 5

Excavation and Offsite Disposal

Subsections:

Site cost over time and present value
Phase technology cost detail for excavation, transport, and disposal
Phase technology cost detail for institutional controls
Phase technology cost detail for 5-year reviews

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	Reviewer
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/9/2004	1/6/2005

Phase	Phase Name	Fiscal Year 1 2005	Fiscal Year 2 2006	Fiscal Year 3 2007
Remedial Action	Institutional Controls (Capital)	$21,923		
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)	$4,974,364		
Long Term Monitoring	LTM			
Sub-Total		$4,996,287	$0	$0
Escalation Factor		1.0000		
Total		$4,996,287	$0	$0
		2005	**2006**	**2007**
Discount Rate	6.0%			
Present Value	2005	$4,996,287	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 4 2008**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**
Remedial Action	Institutional Controls (Capital)			
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)			
Long Term Monitoring	LTM			$16,625
Sub-Total		$0	$0	$16,625
Escalation Factor				1.0944
Total		$0	$0	$18,195
		2008	**2009**	**2010**
Discount Rate	6.0%			
Present Value	2005	$0	$0	$13,596

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator	
Name:	Alan Noell, Ph.D., P.E.	
Title:	Senior Environmental Engineer	
Agency/Org./Office:	EnSafe Inc.	
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	
Phone:	972-791-3222	
Email:	anoell@ensafe.com	
Prepared Date:		11/9/2004

Phase	**Phase Name**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**	**Fiscal Year 9 2013**
Remedial Action	Institutional Controls (Capital)			
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)			
Long Term Monitoring	LTM			
Sub-Total		$0	$0	$0
Escalation Factor				
Total		$0	$0	$0
		2011	**2012**	**2013**
Discount Rate	6.0%			
Present Value	2005	$0	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
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	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**	**Fiscal Year 13 2017**
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)				
Long Term Monitoring	LTM		$16,625		
Sub-Total		$0	$16,625	$0	$0
Escalation Factor			1.2083		
Total		$0	$20,088	$0	$0
		2014	**2015**	**2016**	**2017**
Discount Rate	6.0%				
Present Value	2005	$0	$11,217	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**	**Fiscal Year 16 2020**	**Fiscal Year 17 2021**
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)				
Long Term Monitoring	LTM			$16,625	
Sub-Total		$0	$0	$16,625	$0
Escalation Factor				1.3340	
Total		$0	$0	$22,178	$0
		2018	**2019**	**2020**	**2021**
Discount Rate	6.0%				
Present Value	2005	$0	$0	$9,254	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 18 2022**	**Fiscal Year 19 2023**	**Fiscal Year 20 2024**	**Fiscal Year 21 2025**
Remedial Action	Institutional Controls (Capital)				
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)				
Long Term Monitoring	LTM				$16,625
Sub-Total		$0	$0	$0	$16,625
Escalation Factor					1.4729
Total		$0	$0	$0	$24,487
		2022	**2023**	**2024**	**2025**
Discount Rate	6.0%				
Present Value	2005	$0	$0	$0	$7,635

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 22 2026**	**Fiscal Year 23 2027**	**Fiscal Year 24 2028**
Remedial Action	Institutional Controls (Capital)			
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)			
Long Term Monitoring	LTM			
Sub-Total		$0	$0	$0
Escalation Factor				
Total		$0	$0	$0
		2026	**2027**	**2028**
Discount Rate	6.0%			
Present Value	2005	$0	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**
Remedial Action	Institutional Controls (Capital)			
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)			
Long Term Monitoring	LTM		$16,625	
Sub-Total		$0	$16,625	$0
Escalation Factor			1.6262	
Total		$0	$27,036	$0
		2029	**2030**	**2031**
Discount Rate	6.0%			
Present Value	2005	$0	$6,299	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 28 2032**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**
Remedial Action	Institutional Controls (Capital)			
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)			
Long Term Monitoring	LTM			
Sub-Total		$0	$0	$0
Escalation Factor				
Total		$0	$0	$0
		2032	**2033**	**2034**
Discount Rate	6.0%			
Present Value	2005	$0	$0	$0

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Soil
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: Excavation and Offsite Disposal
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator	
Name:	Alan Noell, Ph.D., P.E.	
Title:	Senior Environmental Engineer	
Agency/Org./Office:	EnSafe Inc.	
	4545 Fuller Drive, Suite 230	
Business Address:	Irving, TX 75038	
Phone:	972-791-3222	
Email:	anoell@ensafe.com	
Prepared Date:		11/9/2004

Phase	**Phase Name**	**Fiscal Year 31 2035**	**Row Total**
Remedial Action	Institutional Controls (Capital)		$21,923
Remedial Action	Excavation, Characterization, Offsite Disposal (Capital)		$4,974,364
Long Term Monitoring	LTM	$16,625	$99,750
Sub-Total		$16,625	$5,096,037
Escalation Factor		1.7954	
Total		$29,849	$5,138,119
		2035	
Discount Rate	6.0%		
Present Value	2005	$5,197	$5,049,485

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name: Alternative 5: Excavation and Offsite Disposal
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the excavation of areas identified in Figure 6-3 to 2-ft and the offsite disposal of excavated soil as hazardous waste. Also, includes replacing excavation volume with clean offsite fill. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 11:44:05 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@yahoo.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Excavation, Characterization, Offsite Disposal
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: Ex Situ
Start Date: 1/1/2005

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Description: Includes the surgical excavation of 18,252 CY of soil. Forty characterization samples would be analyzed for metals, pesticides/PCB, SVOCs, VOCs, and TCLP metals, SVOC, and VOCs. Excavated soils would be transported 200 miles to Emelle, AL and disposed in a RCRA Subtitle D landfill.

Phase Technology Cost Detail Report
(with Markups)

Technology: Excavation

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030279	4 CY, Crawler-mounted, Hydraulic Excavator	18,251.85	CY	0.00	0.80	2.46	$59,428.02	☐
17030418	Delivered & Dumped, Backfill with Stone	4,562.96	BCY	32.00	0.69	1.05	$153,948.34	☐
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	22,824.81	CY	7.66	1.59	2.15	$260,410.55	☐
33020401	Disposable Materials per Sample	40.00	EA	10.78	0.00	0.00	$431.09	☐
33021618	Testing, purgeable organics (624, 8260)	40.00	EA	179.98	0.00	0.00	$7,199.16	☐
33021619	Testing, semi-volatile organics (625, 8270)	40.00	EA	320.34	0.00	0.00	$12,813.69	☐
33021620	Testing, TAL metals (6010/7000s)	40.00	EA	374.77	0.00	0.00	$14,990.88	☐
33021705	Targeted TCLP (Metals, Volatiles, Semi-Volatiles only), Soil Analysis	40.00	EA	756.43	0.00	0.00	$30,257.07	☐
33022133	Testing, pesticides/PCBs (SW3510/SW8080)	40.00	EA	267.39	0.00	0.00	$10,695.50	☐
33170803	Spray washing, decontaminate heavy equipment, decontaminate heavy equipment	1.00	EA	0.00	374.74	0.00	$374.74	☐

Phase Technology Cost Detail Report
(with Markups)

Total Element Cost	**$550,549.03**
Total 1st Year Technology Cost	**$550,549.03**

Phase Technology Cost Detail Report
(with Markups)

Technology: Load and Haul

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17020401	Dump Charges	18,252.00	CY	185.64	0.00	0.00	$3,388,231.92	☑
17030224	966, 4.0 CY, Wheel Loader	92.00	HR	0.00	41.90	83.51	$11,537.97	☐
17030288	26 CY, Semi Dump	8,991.00	HR	0.00	34.91	78.99	$1,024,045.23	☐

Total Element Cost **$4,423,815.12**

Total 1st Year Technology Cost **$4,423,815.12**

Total Phase Cost **$4,974,364.15**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

---

Site

Name: Alternative 5: Excavation and Offsite Disposal
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the excavation of areas identified in Figure 6-3 to 2-ft and the offsite disposal of excavated soil as hazardous waste. Also, includes replacing excavation volume with clean offsite fill. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Phase Technology Cost Detail Report
(with Markups)

Phone:	972-791-3222
Email:	anoell@yahoo.com
Prepared Date:	11/09/2004

Reviewer Information:

Name:	Ben Brantley, P.G.
Title:	Geologist
Agency/Org./Office:	EnSafe Inc.
Business Address:	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	901-372-7962
Email:	bbrantley@ensafe.com
Date Reviewed:	01/06/2005

Phase

Name:	Institutional Controls	**Media/Waste Type:**	N/A
Type:	Remedial Action	**Secondary Media/Waste Type:**	N/A
Labor Rate Group:	System Labor Rate	**Contaminant:**	None
Analysis Rate Group:	System Analysis Rate	**Secondary Contaminant:**	None
Approach:	None	**Markup Template:**	System Defaults
Start Date:	1/1/2005	**O&M Markup Template:**	N/A
Description:	Institutional controls used to maintain C/I status		

Phase Technology Cost Detail Report
(with Markups)

Technology: MEC Institutional Controls

Element: Planning

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	80.00	MI	0.16	0.00	0.00	$12.86	☐
33040927	UXO Senior Scientist	64.00	HR	0.00	80.94	0.00	$5,180.41	☐
33040929	UXO Word Processor	12.00	HR	0.00	27.39	0.00	$328.62	☐
33240101	Other Direct Costs	1.00	LS	75.31	0.00	0.00	$75.31	☑
				Total Element Cost			**$5,597.21**	

Element: Implementation

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	80.00	MI	0.16	0.00	0.00	$12.86	☐
33040927	UXO Senior Scientist	196.00	HR	0.00	80.94	0.00	$15,865.00	☐
33240101	Other Direct Costs	1.00	LS	216.89	0.00	0.00	$216.89	☑
33990105	Letter/Brochure Printing and Distribution, per Page	100.00	EA	2.31	0.00	0.00	$230.53	☐
				Total Element Cost			**$16,325.29**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$21,922.50**
Total Phase Cost	**$21,922.50**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Soil
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for soil cleanup target level exceedances

Site

Name: Alternative 5: Excavation and Offsite Disposal
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the excavation of areas identified in Figure 6-3 to 2-ft and the offsite disposal of excavated soil as hazardous waste. Also, includes replacing excavation volume with clean offsite fill. Includes implementation of institutional controls needed to maintain C/I status and conducting six Five-Year Reviews.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 11:45:29 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@yahoo.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group:
Analysis Rate Group:
Approach: Ex Situ
Start Date: 1/1/2005
Description: This estimate was imported or upgraded from a previous version of RACER and contained no information in this Description field.

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Phase Technology Cost Detail Report
(with Markups)

Technology: Five-Year Review

Element: Document Review

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220105	Project Engineer	4.00	HR	0.00	100.61	0.00	$402.46	☐
33220108	Project Scientist	1.00	HR	0.00	116.47	0.00	$116.47	☐
33220109	Staff Scientist	3.00	HR	0.00	86.32	0.00	$258.96	☐

Total Element Cost **$777.88**

Element: Interviews

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	10.00	HR	0.00	103.76	0.00	$1,037.56	☐

Total Element Cost **$1,037.56**

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	5.00	HR	0.00	103.76	0.00	$518.78	☐
33220105	Project Engineer	6.00	HR	0.00	100.61	0.00	$603.68	☐
33220108	Project Scientist	6.00	HR	0.00	116.47	0.00	$698.79	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Site Inspection

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220109	Staff Scientist	6.00	HR	0.00	86.32	0.00	$517.91	☐

Total Element Cost **$2,339.17**

Element: Report

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220102	Project Manager	12.00	HR	0.00	103.76	0.00	$1,245.07	☐
33220105	Project Engineer	31.00	HR	0.00	100.61	0.00	$3,119.04	☐
33220108	Project Scientist	25.00	HR	0.00	116.47	0.00	$2,911.63	☐
33220109	Staff Scientist	50.00	HR	0.00	86.32	0.00	$4,315.94	☐

Total Element Cost **$11,591.68**

Element: Travel

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010108	Sedan, Automobile, Rental	2.00	DAY	69.41	0.00	0.00	$138.83	☐
33010202	Sample collection, sampling personnel travel, per diem	2.00	DAY	120.00	0.00	0.00	$240.00	☑
33041101	Airfare	1.00	LS	500.00	0.00	0.00	$500.00	☑

Phase Technology Cost Detail Report
(with Markups)

Total Element Cost	**$878.83**
Total 1st Year Technology Cost	**$16,625.11**
Total Phase Cost	**$16,625.11**

Cost Estimates for

Remedial Action Alternatives for Groundwater Contamination at OU 2

Alternative 1

No Action

Subsections:

Site cost over time and present value
Phase technology cost detail for long-term groundwater monitoring

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	**Reviewer**
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
	4545 Fuller Drive, Suite 230	5724 Summer Trees Dr.
Business Address:	Irving, TX 75038	Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/9/2004	1/6/2005

Phase	**Phase Name**	**Fiscal Year 1 2005**	**Fiscal Year 2 2006**	**Fiscal Year 3 2007**	**Fiscal Year 4 2008**
Long Term Monitoring	LTM	$41,394	$55,192	$55,192	$55,192
Sub-Total		$41,394	$55,192	$55,192	$55,192
Escalation Factor		1.0000	1.0150	1.0323	1.0519
Total		$41,394	$56,020	$56,975	$58,057
		2005	**2006**	**2007**	**2008**
Discount Rate	6.0%				
Present Value	2005	$41,394	$52,849	$50,708	$48,746

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$55,192	$55,192	$55,192	$55,192
Escalation Factor		1.0729	1.0944	1.1163	1.1386
Total		$59,216	$60,402	$61,611	$62,842
		2009	**2010**	**2011**	**2012**
Discount Rate	6.0%				
Present Value	2005	$46,905	$45,136	$43,433	$41,794

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 9 2013**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$55,192	$55,192	$55,192	$55,192
Escalation Factor		1.1613	1.1846	1.2083	1.2324
Total		$64,095	$65,381	$66,689	$68,019
		2013	**2014**	**2015**	**2016**
Discount Rate	6.0%				
Present Value	2005	$40,214	$38,699	$37,239	$35,832

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 13 2017**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**	**Fiscal Year 16 2020**
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$55,192	$55,192	$55,192	$55,192
Escalation Factor		1.2571	1.2822	1.3079	1.3340
Total		$69,382	$70,768	$72,186	$73,627
		2017	**2018**	**2019**	**2020**
Discount Rate	6.0%				
Present Value	2005	$34,481	$33,179	$31,928	$30,722

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 17 2021**	**Fiscal Year 18 2022**	**Fiscal Year 19 2023**	**Fiscal Year 20 2024**
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$55,192	$55,192	$55,192	$55,192
Escalation Factor		1.3607	1.3879	1.4157	1.4440
Total		$75,100	$76,601	$78,136	$79,698
		2021	**2022**	**2023**	**2024**
Discount Rate	6.0%				
Present Value	2005	$29,563	$28,447	$27,374	$26,341

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 21 2025**	**Fiscal Year 22 2026**	**Fiscal Year 23 2027**	**Fiscal Year 24 2028**
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$55,192	$55,192	$55,192	$55,192
Escalation Factor		1.4729	1.5023	1.5324	1.5630
Total		$81,293	$82,915	$84,577	$86,266
		2025	**2026**	**2027**	**2028**
Discount Rate	6.0%				
Present Value	2005	$25,347	$24,390	$23,470	$22,584

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**	**Fiscal Year 28 2032**
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$55,192	$55,192	$55,192	$55,192
Escalation Factor		1.5943	1.6262	1.6587	1.6919
Total		$87,993	$89,754	$91,548	$93,380
		2029	**2030**	**2031**	**2032**
Discount Rate	6.0%				
Present Value	2005	$21,732	$20,913	$20,123	$19,364

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 1: No Action
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/9/2004

Phase	**Phase Name**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**	**Fiscal Year 31 2035**	**Row Total**
Long Term Monitoring	LTM	$55,192	$55,192	$13,798	$1,655,760
Sub-Total		$55,192	$55,192	$13,798	$1,655,760
Escalation Factor		1.7257	1.7602	1.7954	
Total		$95,245	$97,150	$24,773	$2,231,092
		2033	**2034**	**2035**	
Discount Rate	6.0%				
Present Value	2005	$18,633	$17,930	$4,313	$983,782

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Groundwater
ID:	NAS Pensacola OU 2 Feasibility Study
Location:	PENSACOLA NAS, FLORIDA
Modifiers:	**Material** 1.005
	Labor 0.7
	Equipment 0.913
Category:	None
Report Option:	Fiscal Year
Description:	Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

---

Site

Name:	Alternative 1: No Action
ID:	NAS Pensacola OU 2 Feasibility Study
Type:	None
Description:	Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil no-action alternative
Program:	Superfund Remedial

Estimator Information:

Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/09/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: None
Start Date: 1/1/2005

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Description: Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives

Phase Technology Cost Detail Report
(with Markups)

Technology: Monitoring

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020401	Disposable Materials per Sample	28.00	EA	11.25	0.00	0.00	$315.11	☐
33020402	Decontamination Materials per Sample	28.00	EA	10.02	0.00	0.00	$280.69	☐
33020561	Lysimeter accessories, nylon tubing, 1/4" OD	200.00	LF	0.68	0.00	0.00	$135.10	☐
33020572	Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Daily Rental	8.00	DAY	34.85	0.00	0.00	$278.82	☐
33021509	Monitor well sampling equipment, rental, water quality testing parameter device rental	4.00	WK	315.12	0.00	0.00	$1,260.46	☐
33021618	Testing, purgeable organics (624, 8260)	28.00	EA	187.94	0.00	0.00	$5,262.39	☐
33021619	Testing, semi-volatile organics (625, 8270)	16.00	EA	334.52	0.00	0.00	$5,352.27	☐
33021620	Testing, TAL metals (6010/7000s)	16.00	EA	391.35	0.00	0.00	$6,261.68	☐
33230614	Peristaltic Pump, Weekly Rental	4.00	WK	154.90	0.00	0.00	$619.61	☐
				Total Element Cost			**$19,766.14**	

Phase Technology Cost Detail Report
(with Markups)

Element: General Monitoring

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	160.00	MI	0.16	0.00	0.00	$25.73	☐
33220102	Project Manager	4.00	HR	0.00	98.30	0.00	$393.18	☐
33220105	Project Engineer	30.00	HR	0.00	95.32	0.00	$2,859.56	☐
33220108	Project Scientist	162.00	HR	0.00	110.34	0.00	$17,874.30	☐
33220109	Staff Scientist	112.00	HR	0.00	81.78	0.00	$9,158.88	☐
33220112	Field Technician	46.00	HR	0.00	60.92	0.00	$2,802.45	☐
33220114	Word Processing/Clerical	26.00	HR	0.00	42.44	0.00	$1,103.43	☐
33220115	Draftsman/CADD	22.00	HR	0.00	55.48	0.00	$1,220.60	☐

Total Element Cost	**$35,438.14**
Total 1st Year Technology Cost	**$55,204.27**
Total Phase Cost	**$55,204.27**

Cost Estimates for

Remedial Action Alternatives for Groundwater Contamination at OU 2

Alternative 2

Riparian Corridors

Subsections:

Site cost over time and present value
Phase technology cost detail for construction and operation
Phase cost summary for design
Phase technology cost detail for long-term groundwater monitoring

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	**Reviewer**
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/17/2004	1/6/2005

Phase	**Phase Name**	**Fiscal Year 1 2005**	**Fiscal Year 2 2006**	**Fiscal Year 3 2007**	**Fiscal Year 4 2008**
Design	Design	$27,547			
Remedial Action	Construction & Monitoring	$183,158	$37,510	$37,510	$37,510
Long Term Monitoring	LTM	$41,394	$55,192	$55,192	$55,192
Sub-Total		$252,099	$92,702	$92,702	$92,702
Escalation Factor		1.0000	1.0150	1.0323	1.0519
Total		$252,099	$94,092	$95,696	$97,513
		2005	**2006**	**2007**	**2008**
Discount Rate	6.0%				
Present Value	2005	$252,099	$88,766	$85,169	$81,874

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**
Design	Design				
Remedial Action	Construction & Monitoring	$37,510	$37,510	$37,510	$37,510
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$92,702	$92,702	$92,702	$92,702
Escalation Factor		1.0729	1.0944	1.1163	1.1386
Total		$99,460	$101,453	$103,483	$105,550
		2009	**2010**	**2011**	**2012**
Discount Rate	6.0%				
Present Value	2005	$78,781	$75,811	$72,951	$70,197

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 9 2013**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**
Design	Design				
Remedial Action	Construction & Monitoring	$37,510	$37,510	$37,510	$37,510
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$92,702	$92,702	$92,702	$92,702
Escalation Factor		1.1613	1.1846	1.2083	1.2324
Total		$107,654	$109,814	$112,011	$114,246
		2013	**2014**	**2015**	**2016**
Discount Rate	6.0%				
Present Value	2005	$67,544	$64,999	$62,547	$60,183

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
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Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 13 2017**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**	**Fiscal Year 16 2020**
Design	Design				
Remedial Action	Construction & Monitoring	$37,510	$37,510	$37,510	$37,510
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$92,702	$92,702	$92,702	$92,702
Escalation Factor		1.2571	1.2822	1.3079	1.3340
Total		$116,535	$118,862	$121,245	$123,664
		2017	**2018**	**2019**	**2020**
Discount Rate	6.0%				
Present Value	2005	$57,914	$55,727	$53,627	$51,601

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/14/2005
Time: 1:27 PM

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Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 17 2021**	**Fiscal Year 18 2022**	**Fiscal Year 19 2023**	**Fiscal Year 20 2024**
Design	Design				
Remedial Action	Construction & Monitoring	$37,510	$37,510	$37,510	$37,510
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$92,702	$92,702	$92,702	$92,702
Escalation Factor		1.3607	1.3879	1.4157	1.4440
Total		$126,139	$128,661	$131,238	$133,861
		2021	**2022**	**2023**	**2024**
Discount Rate	6.0%				
Present Value	2005	$49,654	$47,780	$45,978	$44,243

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
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	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
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Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 21 2025**	**Fiscal Year 22 2026**	**Fiscal Year 23 2027**	**Fiscal Year 24 2028**
Design	Design				
Remedial Action	Construction & Monitoring	$37,510	$37,510	$37,510	$37,510
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$92,702	$92,702	$92,702	$92,702
Escalation Factor		1.4729	1.5023	1.5324	1.5630
Total		$136,540	$139,266	$142,056	$144,893
		2025	**2026**	**2027**	**2028**
Discount Rate	6.0%				
Present Value	2005	$42,574	$40,966	$39,421	$37,933

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**	**Fiscal Year 28 2032**
Design	Design				
Remedial Action	Construction & Monitoring	$37,510	$37,510	$37,510	$37,510
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$92,702	$92,702	$92,702	$92,702
Escalation Factor		1.5943	1.6262	1.6587	1.6919
Total		$147,794	$150,751	$153,764	$156,842
		2029	**2030**	**2031**	**2032**
Discount Rate	6.0%				
Present Value	2005	$36,502	$35,125	$33,799	$32,524

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 2: Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**	**Fiscal Year 31 2035**	**Row Total**
Design	Design				$27,547
Remedial Action	Construction & Monitoring	$37,510	$37,510	$37,510	$1,308,458
Long Term Monitoring	LTM	$55,192	$55,192	$13,798	$1,655,760
Sub-Total		$92,702	$92,702	$51,308	$2,991,765
Escalation Factor		1.7257	1.7602	1.7954	
Total		$159,975	$163,174	$92,117	$3,980,449
		2033	**2034**	**2035**	
Discount Rate	6.0%				
Present Value	2005	$31,296	$30,115	$16,039	$1,843,738

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Groundwater
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name: Alternative 2: Riparian Corridors
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the riparian corridors. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 11:51:06 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Construction & Monitoring
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: In Situ
Start Date: 9/1/2005

Media/Waste Type: Groundwater
Secondary Media/Waste Type: Soil
Contaminant: Volatile Organic Compounds (VOCs)
Secondary Contaminant: Semi-Volatile Organic Compounds (SVOCs)
Markup Template: System Defaults
O&M Markup Template: System Defaults

Description: Construction 3,240 ft of riparian corridors, clearing and grubbing, irrigation system, ten 2-inch monitoring wells to depth of 15 ft, and MNA monitoring of riparian corridors for 30 years.

Phase Technology Cost Detail Report
(with Markups)

Technology: Phytoremediation

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010112	Mobilization Equipment (Wetlands)	1.00	LS	7,118.53	0.00	0.00	$7,118.53	☐
33010113	Demobilize Equipment (Wetlands)	1.00	LS	7,118.53	0.00	0.00	$7,118.53	☐
33111028	Plant Trees, includes cover soil (3' Whip)	1,674.00	EA	0.00	2.62	0.00	$4,393.58	☐
33111034	3' Whip Tree - Phytoremediation Young Tree	1,674.00	EA	2.14	0.00	0.00	$3,574.83	☐

Total Element Cost **$22,205.47**

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010105	Sample collection, vehicle mileage charge, pickup truck	80.00	MI	0.26	0.00	0.00	$20.90	☐

Total Element Cost **$20.90**

Total 1st Year Technology Cost **$22,226.37**

Phase Technology Cost Detail Report
(with Markups)

Technology: Natural Attenuation

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020401	Disposable Materials per Sample	11.00	EA	10.92	0.00	0.00	$120.12	☐
33020402	Decontamination Materials per Sample	11.00	EA	9.73	0.00	0.00	$107.00	☐
33021509	Monitor well sampling equipment, rental, water quality testing parameter device rental	1.00	WK	305.77	0.00	0.00	$305.77	☐
33021602	Testing, soil & sediment analysis, pH, electrometric (9045)	11.00	EA	9.65	0.00	0.00	$106.12	☐
33021603	Testing, dissolved solids	11.00	EA	17.02	0.00	0.00	$187.18	☐
33021608	Testing, nitrogen, nitrate/nitrite	11.00	EA	32.09	0.00	0.00	$352.94	☐
33021618	Testing, purgeable organics (624, 8260)	11.00	EA	200.60	0.00	0.00	$2,206.65	☐
33021653	Testing, chloride	11.00	EA	23.43	0.00	0.00	$257.77	☐
33021663	Testing, dissolved oxygen (DO)	11.00	EA	18.95	0.00	0.00	$208.44	☐
33021667	Testing, soil & sediment analysis, sulfates (375.3m)	11.00	EA	25.09	0.00	0.00	$276.01	☐
33021668	Testing, sulfur: sulfate, sulfide, sulfite	11.00	EA	40.26	0.00	0.00	$442.89	☐
33021673	Testing, total organic carbons	11.00	EA	34.49	0.00	0.00	$379.44	☐
33021678	Ferrous Iron (S.M. 3500 Fe - D)	11.00	EA	129.04	0.00	0.00	$1,419.49	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33021679	Dissolved Iron (II)	11.00	EA	40.13	0.00	0.00	$441.44	☐
33231186	Well Development Equipment Rental (weekly)	1.00	WK	566.27	53.02	0.00	$619.29	☐
33232407	PVC bailers, disposable polyethylene, 1.50" OD x 36"	10.00	EA	7.88	0.00	0.00	$78.79	☐

Total Element Cost **$7,509.33**

Element: General

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	120.00	MI	0.16	0.00	0.00	$19.30	☐
33020577	Oxygen/reduction potential meter rental	2.00	DAY	76.10	0.00	0.00	$152.20	☐
33220102	Project Manager	4.00	HR	0.00	96.48	0.00	$385.90	☐
33220105	Project Engineer	30.00	HR	0.00	93.55	0.00	$2,806.61	☐
33220108	Project Scientist	90.00	HR	0.00	108.29	0.00	$9,746.28	☐
33220109	Staff Scientist	98.00	HR	0.00	80.26	0.00	$7,865.62	☐
33220112	Field Technician	29.00	HR	0.00	59.79	0.00	$1,734.04	☐
33220114	Word Processing/Clerical	23.00	HR	0.00	41.65	0.00	$958.04	☐

Phase Technology Cost Detail Report
(with Markups)

Element: General

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220115	Draftsman/CADD	19.00	HR	0.00	54.45	0.00	$1,034.64	☐

Total Element Cost **$24,702.62**

Element: Surface Soil

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020603	Surface Soil Sampling Equipment	1.00	EA	485.03	0.00	0.00	$485.03	☐
33021102	Testing, moisture content (209a)	11.00	EA	33.56	0.00	0.00	$369.12	☐
33021720	Testing, purgeable organics (624, 8260)	11.00	EA	200.60	0.00	0.00	$2,206.65	☐
33021742	Testing, soil & sediment analysis, sulfates (375.3m)	11.00	EA	25.09	0.00	0.00	$276.01	☐
33021743	Testing, sulfur: sulfate, sulfide, sulfite	11.00	EA	40.26	0.00	0.00	$442.89	☐
33021744	Testing, soil & sediment analysis, pH, electrometric (9045)	11.00	EA	9.65	0.00	0.00	$106.12	☐
33021746	Testing, soil & sediment analysis, total organic carbon (16.3)	11.00	EA	36.84	0.00	0.00	$405.29	☐
33021753	Testing, soil & sediment analysis, nitrogen, nitrate/nitrite (353.3)	11.00	EA	36.48	0.00	0.00	$401.33	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Surface Soil

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33021754	Testing, soil & sediment analysis, chloride, titrimetric (9252)	11.00	EA	28.84	0.00	0.00	$317.25	☐
			Total Element Cost				**$5,009.70**	
			Total 1st Year Technology Cost				**$37,221.65**	

Phase Technology Cost Detail Report
(with Markups)

Technology: Operations and Maintenance

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010202	Sample collection, sampling personnel travel, per diem	2.00	DAY	120.00	0.00	0.00	$240.00	☑
33010206	Mobilize Crew, Local, per Person	1.00	EA	56.61	0.00	0.00	$56.61	☐
99020110	Annual Maintenance Materials and Labor	1.00	LS	0.00	0.00	0.00	$0.00	☐

Total Element Cost	**$296.61**
Total 1st Year Technology Cost	**$296.61**
Runtime Percent Cost Adjustment	**97%**
O & M Total Cost	**$287.71**

Phase Technology Cost Detail Report
(with Markups)

Technology: Groundwater Monitoring Well

Element: Aquifer 1

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020303	Organic Vapor Analyzer Rental, per Day	2.00	DAY	150.31	0.00	0.00	$300.62	☐
33170808	Decontaminate Rig, Augers, Screen (Rental Equipment)	2.00	DAY	21.89	434.05	0.00	$911.88	☐
33220112	Field Technician	32.00	HR	0.00	59.79	0.00	$1,913.43	☐
33230101	2" PVC, Schedule 40, Well Casing	50.00	LF	1.48	3.12	8.31	$645.44	☐
33230201	2" PVC, Schedule 40, Well Screen	100.00	LF	3.41	4.03	10.72	$1,815.76	☐
33230301	2" PVC, Well Plug	10.00	EA	7.19	4.68	12.46	$243.34	☐
33231101	Hollow Stem Auger, 8" Dia Borehole, Depth <= 100 ft	160.00	LF	0.00	8.56	22.79	$5,015.46	☐
33231401	2" Screen, Filter Pack	120.00	LF	3.83	2.65	7.06	$1,626.14	☐
33231811	2" Well, Portland Cement Grout	10.00	LF	1.43	0.00	0.00	$14.28	☐
33232101	2" Well, Bentonite Seal	10.00	EA	11.40	10.54	28.04	$499.77	☐
33232211	2" Well Finish, Flush with Grade, 8" x 7.5" Manhole, Locking Cap	10.00	EA	72.62	87.79	233.71	$3,941.18	☐
				Total Element Cost			**$16,927.29**	

Phase Technology Cost Detail Report
(with Markups)

Element: General Aquifers

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010101	Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	0.00	1,112.27	1,129.26	$2,241.53	☐
33231504	Surface Pad, Concrete, 2' x 2' x 4"	10.00	EA	47.59	14.63	2.05	$642.74	☐
				Total Element Cost			**$2,884.27**	
			Total 1st Year Technology Cost				**$19,811.56**	

Phase Technology Cost Detail Report
(with Markups)

Technology: Clear and Grub

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17010102	Selective clearing, brush, medium clearing, with dozer and brush rake, excludes removal offsite	2.23	ACR	0.00	96.63	108.94	$458.43	☐
17010111	Clear trees, wet conditions, medium growth, 200 H.P. dozer, excludes grubbing	2.23	ACR	0.00	1,082.36	1,117.84	$4,906.46	☐
17010211	Site clearing trees, with 335 H.P. dozer, to 12" diameter	446.00	EA	0.00	4.05	8.46	$5,576.92	☐
17010311	Remove stumbs, wet conditions, with dozer, 6" to 12" diameter	223.00	EA	0.00	37.93	54.47	$20,605.94	☐
17010315	Grub stumps, with 335 H.P. dozer, to 12" diameter	223.00	EA	0.00	2.43	5.07	$1,673.06	☐
17010501	Grub and stack, 140 H.P. dozer	269.83	CY	0.00	2.43	1.67	$1,106.36	☐
17010510	Grub and stack, 140 H.P. dozer	179.89	CY	0.00	2.43	1.67	$737.58	☐
17020401	Dump Charges	1,963.29	CY	19.57	0.00	0.00	$38,414.91	☑
17030222	926, 2.0 CY, Wheel Loader	38.00	HR	0.00	43.12	50.78	$3,568.28	☐
17030287	20 CY, Semi Dump	77.00	HR	0.00	35.92	80.89	$8,994.65	☐

Total Element Cost **$86,042.58**

Total 1st Year Technology Cost **$86,042.58**

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:51:06 AM

Phase Technology Cost Detail Report
(with Markups)

Technology: Sprinkler System

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030255	Trenching to 48" Deep, Including Backfill & Compaction	129.85	CY	0.00	9.01	1.35	$1,345.45	☐
18050704	Full Circle Sprinkler Head, 80' Diameter	47.00	EA	366.17	41.23	0.00	$19,147.58	☐
18050705	Control Box	1.00	EA	1,555.69	366.34	0.00	$1,922.03	☐
18050706	Valves, iron body, gate, OS&Y, threaded, 125 lb., 2-1/2"	1.00	EA	731.52	57.29	0.00	$788.80	☐
18050707	4" Reducer	1.00	EA	14.87	43.17	0.00	$58.04	☐
18050710	Testing & Inspection of Sprinkler System	1.00	LS	0.00	522.67	0.00	$522.67	☐
19010201	Polyvinyl chloride pressure pipe, 3/4", class 200, SDR 21, includes trenching to 3' deep	1,496.00	LF	0.41	4.65	1.98	$10,530.04	☐
19010202	Polyvinyl chloride pressure pipe, 1", class 200, SDR 21, includes trenching to 3' deep	888.00	LF	0.52	4.98	2.12	$6,775.80	☐
19010205	Polyvinyl chloride pressure pipe, 2-1/2", class 200, SDR 21, includes trenching to 3' deep	1,122.00	LF	2.52	6.98	2.97	$13,986.40	☐
				Total Element Cost			**$55,076.81**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$55,076.81**
Total Phase Cost	**$220,666.68**

Phase Cost Summary Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Groundwater
ID:	NAS Pensacola OU 2 Feasibility Study
Location:	PENSACOLA NAS, FLORIDA
Modifiers:	**Material** 1.005
	Labor 0.7
	Equipment 0.913
Category:	None
Report Option:	Fiscal Year
Description:	Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name:	Alternative 2: Riparian Corridors
ID:	NAS Pensacola OU 2 Feasibility Study
Type:	None
Description:	Includes the design, construction, and operation of the riparian corridors. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program:	Superfund Remedial

Estimator Information:

Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Reviewer Information:

Phase Cost Summary Report
(with Markups)

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Design
Type: Design
Start Date: 1/1/2005
Description: Design of riparian corridors

Phase Cost Summary Report
(with Markups)

Phase Name	Phase	Approach	Capital Costs	Design %	RD Cost
Construction & Monitoring	Remedial Action	In Situ Treatment	$220,379	12.5%	$27,547

Total Phase Cost	$27,547
Escalation	$0
Escalated Phase Cost	$27,547

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Groundwater
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name: Alternative 2: Riparian Corridors
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the riparian corridors. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:51:46 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name:	LTM	**Media/Waste Type:**	N/A
Type:	Long Term Monitoring	**Secondary Media/Waste Type:**	N/A
Labor Rate Group:	System Labor Rate	**Contaminant:**	None
Analysis Rate Group:	System Analysis Rate	**Secondary Contaminant:**	None
Approach:	None	**Markup Template:**	System Defaults
Start Date:	1/1/2005	**O&M Markup Template:**	N/A

Description: Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives

Phase Technology Cost Detail Report
(with Markups)

Technology: Monitoring

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020401	Disposable Materials per Sample	28.00	EA	11.25	0.00	0.00	$315.11	☐
33020402	Decontamination Materials per Sample	28.00	EA	10.02	0.00	0.00	$280.69	☐
33020561	Lysimeter accessories, nylon tubing, 1/4" OD	200.00	LF	0.68	0.00	0.00	$135.10	☐
33020572	Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Daily Rental	8.00	DAY	34.85	0.00	0.00	$278.82	☐
33021509	Monitor well sampling equipment, rental, water quality testing parameter device rental	4.00	WK	315.12	0.00	0.00	$1,260.46	☐
33021618	Testing, purgeable organics (624, 8260)	28.00	EA	187.94	0.00	0.00	$5,262.39	☐
33021619	Testing, semi-volatile organics (625, 8270)	16.00	EA	334.52	0.00	0.00	$5,352.27	☐
33021620	Testing, TAL metals (6010/7000s)	16.00	EA	391.35	0.00	0.00	$6,261.68	☐
33230614	Peristaltic Pump, Weekly Rental	4.00	WK	154.90	0.00	0.00	$619.61	☐
				Total Element Cost			**$19,766.14**	

Phase Technology Cost Detail Report
(with Markups)

Element: General Monitoring

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	160.00	MI	0.16	0.00	0.00	$25.73	☐
33220102	Project Manager	4.00	HR	0.00	98.30	0.00	$393.18	☐
33220105	Project Engineer	30.00	HR	0.00	95.32	0.00	$2,859.56	☐
33220108	Project Scientist	162.00	HR	0.00	110.34	0.00	$17,874.30	☐
33220109	Staff Scientist	112.00	HR	0.00	81.78	0.00	$9,158.88	☐
33220112	Field Technician	46.00	HR	0.00	60.92	0.00	$2,802.45	☐
33220114	Word Processing/Clerical	26.00	HR	0.00	42.44	0.00	$1,103.43	☐
33220115	Draftsman/CADD	22.00	HR	0.00	55.48	0.00	$1,220.60	☐

Total Element Cost	**$35,438.14**
Total 1st Year Technology Cost	**$55,204.27**
Total Phase Cost	**$55,204.27**

Cost Estimates for

Remedial Action Alternatives for Groundwater Contamination at OU 2

Alternative 3

Permeable Reactive Barrier and Riparian Corridors

Subsections:

Site cost over time and present value
Phase technology cost detail for construction and operation
Phase cost summary for design
Phase technology cost detail for long-term groundwater monitoring

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: PRB and Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	Reviewer
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/17/2004	1/6/2005

Phase	Phase Name	Fiscal Year 1 2005	Fiscal Year 2 2006	Fiscal Year 3 2007	Fiscal Year 4 2008
Design	Design	$124,523			
Remedial Action	Construction & Monitoring	$2,453,396	$65,962	$65,962	$65,962
Long Term Monitoring	LTM	$41,394	$55,192	$55,192	$55,192
Sub-Total		$2,619,313	$121,154	$121,154	$121,154
Escalation Factor		1.0000	1.0150	1.0323	1.0519
Total		$2,619,314	$122,971	$125,067	$127,442

		2005	**2006**	**2007**	**2008**
Discount Rate	6.0%				
Present Value	2005	$2,619,314	$116,011	$111,309	$107,003

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/14/2005
Time: 1:25 PM

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: PRB and Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**
Design	Design				
Remedial Action	Construction & Monitoring	$65,962	$65,962	$65,962	$65,962
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$121,154	$121,154	$121,154	$121,154
Escalation Factor		1.0729	1.0944	1.1163	1.1386
Total		$129,986	$132,591	$135,244	$137,946
		2009	**2010**	**2011**	**2012**
Discount Rate	6.0%				
Present Value	2005	$102,961	$99,080	$95,342	$91,742

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: PRB and Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 9 2013**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**
Design	Design				
Remedial Action	Construction & Monitoring	$65,962	$65,962	$65,962	$65,962
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$121,154	$121,154	$121,154	$121,154
Escalation Factor		1.1613	1.1846	1.2083	1.2324
Total		$140,696	$143,519	$146,390	$149,310
		2013	**2014**	**2015**	**2016**
Discount Rate	6.0%				
Present Value	2005	$88,275	$84,949	$81,744	$78,655

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: PRB and Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 13 2017**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**	**Fiscal Year 16 2020**
Design	Design				
Remedial Action	Construction & Monitoring	$65,962	$65,962	$65,962	$65,962
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$121,154	$121,154	$121,154	$121,154
Escalation Factor		1.2571	1.2822	1.3079	1.3340
Total		$152,303	$155,344	$158,457	$161,619
		2017	**2018**	**2019**	**2020**
Discount Rate	6.0%				
Present Value	2005	$75,690	$72,831	$70,086	$67,438

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: PRB and Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 17 2021**	**Fiscal Year 18 2022**	**Fiscal Year 19 2023**	**Fiscal Year 20 2024**
Design	Design				
Remedial Action	Construction & Monitoring	$65,962	$65,962	$65,962	$65,962
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$121,154	$121,154	$121,154	$121,154
Escalation Factor		1.3607	1.3879	1.4157	1.4440
Total		$164,854	$168,150	$171,518	$174,946
		2021	**2022**	**2023**	**2024**
Discount Rate	6.0%				
Present Value	2005	$64,894	$62,445	$60,090	$57,822

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: PRB and Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com

Prepared Date: 11/17/2004

Phase	Phase Name	Fiscal Year 21 2025	Fiscal Year 22 2026	Fiscal Year 23 2027	Fiscal Year 24 2028
Design	Design				
Remedial Action	Construction & Monitoring	$65,962	$65,962	$65,962	$65,962
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$121,154	$121,154	$121,154	$121,154
Escalation Factor		1.4729	1.5023	1.5324	1.5630
Total		$178,448	$182,010	$185,656	$189,364
		2025	**2026**	**2027**	**2028**
Discount Rate	6.0%				
Present Value	2005	$55,641	$53,539	$51,521	$49,575

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: PRB and Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**	**Fiscal Year 28 2032**
Design	Design				
Remedial Action	Construction & Monitoring	$65,962	$65,962	$65,962	$65,962
Long Term Monitoring	LTM	$55,192	$55,192	$55,192	$55,192
Sub-Total		$121,154	$121,154	$121,154	$121,154
Escalation Factor		1.5943	1.6262	1.6587	1.6919
Total		$193,156	$197,021	$200,958	$204,980
		2029	**2030**	**2031**	**2032**
Discount Rate	6.0%				
Present Value	2005	$47,705	$45,906	$44,173	$42,506

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 3: PRB and Riparian Corridors
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**	**Fiscal Year 31 2035**	**Row Total**
Design	Design				$124,523
Remedial Action	Construction & Monitoring	$65,962	$65,962	$37,343	$4,403,637
Long Term Monitoring	LTM	$55,192	$55,192	$13,798	$1,655,760
Sub-Total		$121,154	$121,154	$51,141	$6,183,920
Escalation Factor		1.7257	1.7602	1.7954	
Total		$209,075	$213,255	$91,818	$7,463,410
		2033	**2034**	**2035**	
Discount Rate	6.0%				
Present Value	2005	$40,901	$39,358	$15,986	$4,694,490

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Groundwater
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name: Alternative 3: PRB and Riparian Corridors
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the PRB and the riparian corridors. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 11:55:28 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Construction & Monitoring
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: In Situ
Start Date: 9/1/2005

Media/Waste Type: Groundwater
Secondary Media/Waste Type: Soil
Contaminant: Volatile Organic Compounds (VOCs)
Secondary Contaminant: Semi-Volatile Organic Compounds (SVOCs)
Markup Template: System Defaults
O&M Markup Template: System Defaults

Description: Construction 720-ft of PRB and 15 performance monitoring wells, 3,240 ft of riparian corridors and 10 performance monitoring wells, clearing and grubbing, irrigation system, and MNA and VOC monitoring of riparian corridors and VOC sampling of PRB for 30 years.

Phase Technology Cost Detail Report
(with Markups)

Technology: Phytoremediation

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010112	Mobilization Equipment (Wetlands)	1.00	LS	7,025.28	0.00	0.00	$7,025.28	☐
33010113	Demobilize Equipment (Wetlands)	1.00	LS	7,025.28	0.00	0.00	$7,025.28	☐
33111028	Plant Trees, includes cover soil (3' Whip)	1,674.00	EA	0.00	2.55	0.00	$4,269.87	☐
33111034	3' Whip Tree - Phytoremediation Young Tree	1,674.00	EA	2.11	0.00	0.00	$3,527.96	☐
				Total Element Cost			**$21,848.38**	

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010105	Sample collection, vehicle mileage charge, pickup truck	80.00	MI	0.26	0.00	0.00	$20.90	☐
				Total Element Cost			**$20.90**	

Total 1st Year Technology Cost **$21,869.28**

Phase Technology Cost Detail Report
(with Markups)

Technology: Natural Attenuation

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020401	Disposable Materials per Sample	11.00	EA	10.78	0.00	0.00	$118.55	☐
33020402	Decontamination Materials per Sample	11.00	EA	9.60	0.00	0.00	$105.60	☐
33021509	Monitor well sampling equipment, rental, water quality testing parameter device rental	1.00	WK	301.76	0.00	0.00	$301.76	☐
33021602	Testing, soil & sediment analysis, pH, electrometric (9045)	11.00	EA	9.52	0.00	0.00	$104.73	☐
33021603	Testing, dissolved solids	11.00	EA	16.79	0.00	0.00	$184.73	☐
33021608	Testing, nitrogen, nitrate/nitrite	11.00	EA	31.67	0.00	0.00	$348.32	☐
33021618	Testing, purgeable organics (624, 8260)	11.00	EA	197.98	0.00	0.00	$2,177.75	☐
33021653	Testing, chloride	11.00	EA	23.13	0.00	0.00	$254.39	☐
33021663	Testing, dissolved oxygen (DO)	11.00	EA	18.70	0.00	0.00	$205.71	☐
33021667	Testing, soil & sediment analysis, sulfates (375.3m)	11.00	EA	24.76	0.00	0.00	$272.39	☐
33021668	Testing, sulfur: sulfate, sulfide, sulfite	11.00	EA	39.73	0.00	0.00	$437.08	☐
33021673	Testing, total organic carbons	11.00	EA	34.04	0.00	0.00	$374.46	☐
33021678	Ferrous Iron (S.M. 3500 Fe - D)	11.00	EA	127.35	0.00	0.00	$1,400.90	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33021679	Dissolved Iron (II)	11.00	EA	39.61	0.00	0.00	$435.66	☐
33231186	Well Development Equipment Rental (weekly)	1.00	WK	558.85	51.53	0.00	$610.38	☐
33232407	PVC bailers, disposable polyethylene, 1.50" OD x 36"	10.00	EA	7.78	0.00	0.00	$77.76	☐
				Total Element Cost			**$7,410.16**	

Element: General

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	120.00	MI	0.16	0.00	0.00	$19.30	☐
33020577	Oxygen/reduction potential meter rental	2.00	DAY	75.10	0.00	0.00	$150.21	☐
33220102	Project Manager	4.00	HR	0.00	96.48	0.00	$385.90	☐
33220105	Project Engineer	30.00	HR	0.00	93.55	0.00	$2,806.61	☐
33220108	Project Scientist	90.00	HR	0.00	108.29	0.00	$9,746.28	☐
33220109	Staff Scientist	98.00	HR	0.00	80.26	0.00	$7,865.62	☐
33220112	Field Technician	29.00	HR	0.00	59.79	0.00	$1,734.04	☐
33220114	Word Processing/Clerical	23.00	HR	0.00	41.65	0.00	$958.04	☐

Phase Technology Cost Detail Report
(with Markups)

Element: General

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220115	Draftsman/CADD	19.00	HR	0.00	54.45	0.00	$1,034.64	☐

Total Element Cost **$24,700.63**

Element: Surface Soil

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020603	Surface Soil Sampling Equipment	1.00	EA	478.68	0.00	0.00	$478.68	☐
33021102	Testing, moisture content (209a)	11.00	EA	33.12	0.00	0.00	$364.29	☐
33021720	Testing, purgeable organics (624, 8260)	11.00	EA	197.98	0.00	0.00	$2,177.75	☐
33021742	Testing, soil & sediment analysis, sulfates (375.3m)	11.00	EA	24.76	0.00	0.00	$272.39	☐
33021743	Testing, sulfur: sulfate, sulfide, sulfite	11.00	EA	39.73	0.00	0.00	$437.08	☐
33021744	Testing, soil & sediment analysis, pH, electrometric (9045)	11.00	EA	9.52	0.00	0.00	$104.73	☐
33021746	Testing, soil & sediment analysis, total organic carbon (16.3)	11.00	EA	36.36	0.00	0.00	$399.98	☐
33021753	Testing, soil & sediment analysis, nitrogen, nitrate/nitrite (353.3)	11.00	EA	36.01	0.00	0.00	$396.07	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Surface Soil

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33021754	Testing, soil & sediment analysis, chloride, titrimetric (9252)	11.00	EA	28.46	0.00	0.00	$313.10	☐

Total Element Cost	**$4,944.07**
Total 1st Year Technology Cost	**$37,054.85**

Phase Technology Cost Detail Report (with Markups)

Technology: Operations and Maintenance

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010202	Sample collection, sampling personnel travel, per diem	2.00	DAY	120.00	0.00	0.00	$240.00	☑
33010206	Mobilize Crew, Local, per Person	1.00	EA	56.61	0.00	0.00	$56.61	☐
99020110	Annual Maintenance Materials and Labor	1.00	LS	0.00	0.00	0.00	$0.00	☐

Total Element Cost	**$296.61**
Total 1st Year Technology Cost	**$296.61**
Runtime Percent Cost Adjustment	**97%**
O & M Total Cost	**$287.71**

Phase Technology Cost Detail Report
(with Markups)

Technology: Groundwater Monitoring Well

Element: Aquifer 1

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020303	Organic Vapor Analyzer Rental, per Day	2.00	DAY	148.34	0.00	0.00	$296.68	☐
33170808	Decontaminate Rig, Augers, Screen (Rental Equipment)	2.00	DAY	21.61	421.82	0.00	$886.86	☐
33220112	Field Technician	32.00	HR	0.00	59.79	0.00	$1,913.43	☐
33230101	2" PVC, Schedule 40, Well Casing	50.00	LF	1.46	3.03	8.03	$625.99	☐
33230201	2" PVC, Schedule 40, Well Screen	100.00	LF	3.37	3.91	10.36	$1,763.61	☐
33230301	2" PVC, Well Plug	10.00	EA	7.09	4.55	12.04	$236.85	☐
33231101	Hollow Stem Auger, 8" Dia Borehole, Depth <= 100 ft	160.00	LF	0.00	8.32	22.01	$4,853.28	☐
33231401	2" Screen, Filter Pack	120.00	LF	3.78	2.58	6.82	$1,582.42	☐
33231811	2" Well, Portland Cement Grout	10.00	LF	1.41	0.00	0.00	$14.09	☐
33232101	2" Well, Bentonite Seal	10.00	EA	11.25	10.24	27.09	$485.80	☐
33232211	2" Well Finish, Flush with Grade, 8" x 7.5" Manhole, Locking Cap	10.00	EA	71.67	85.32	225.78	$3,827.71	☐

Total Element Cost **$16,486.72**

Phase Technology Cost Detail Report
(with Markups)

Element: General Aquifers

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010101	Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	0.00	1,080.94	1,090.98	$2,171.92	☐
33231504	Surface Pad, Concrete, 2' x 2' x 4"	10.00	EA	46.97	14.22	1.98	$631.69	☐

Total Element Cost **$2,803.61**

Total 1st Year Technology Cost **$19,290.32**

Phase Technology Cost Detail Report
(with Markups)

Technology: Clear and Grub

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17010102	Selective clearing, brush, medium clearing, with dozer and brush rake, excludes removal offsite	2.23	ACR	0.00	93.91	105.25	$444.13	☐
17010111	Clear trees, wet conditions, medium growth, 200 H.P. dozer, excludes grubbing	2.23	ACR	0.00	1,051.87	1,079.95	$4,753.97	☐
17010211	Site clearing trees, with 335 H.P. dozer, to 12" diameter	446.00	EA	0.00	3.93	8.17	$5,398.16	☐
17010311	Remove stumbs, wet conditions, with dozer, 6" to 12" diameter	223.00	EA	0.00	36.86	52.62	$19,955.89	☐
17010315	Grub stumps, with 335 H.P. dozer, to 12" diameter	223.00	EA	0.00	2.36	4.90	$1,619.45	☐
17010501	Grub and stack, 140 H.P. dozer	269.83	CY	0.00	2.36	1.62	$1,072.60	☐
17010510	Grub and stack, 140 H.P. dozer	179.89	CY	0.00	2.36	1.62	$715.08	☐
17020401	Dump Charges	1,963.29	CY	19.31	0.00	0.00	$37,911.72	☑
17030222	926, 2.0 CY, Wheel Loader	38.00	HR	0.00	41.90	49.06	$3,456.70	☐
17030287	20 CY, Semi Dump	77.00	HR	0.00	34.91	78.15	$8,705.59	☐

Total Element Cost **$84,033.29**

Total 1st Year Technology Cost **$84,033.29**

Phase Technology Cost Detail Report
(with Markups)

Technology: Sprinkler System

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030255	Trenching to 48" Deep, Including Backfill & Compaction	129.85	CY	0.00	8.75	1.31	$1,306.55	☐
18050704	Full Circle Sprinkler Head, 80' Diameter	47.00	EA	361.37	40.07	0.00	$18,867.54	☐
18050705	Control Box	1.00	EA	1,535.31	356.02	0.00	$1,891.33	☐
18050706	Valves, iron body, gate, OS&Y, threaded, 125 lb., 2-1/2"	1.00	EA	721.93	55.67	0.00	$777.61	☐
18050707	4" Reducer	1.00	EA	14.67	41.95	0.00	$56.62	☐
18050710	Testing & Inspection of Sprinkler System	1.00	LS	0.00	507.94	0.00	$507.94	☐
19010201	Polyvinyl chloride pressure pipe, 3/4", class 200, SDR 21, includes trenching to 3' deep	1,496.00	LF	0.40	4.52	1.92	$10,225.61	☐
19010202	Polyvinyl chloride pressure pipe, 1", class 200, SDR 21, includes trenching to 3' deep	888.00	LF	0.52	4.84	2.05	$6,581.15	☐
19010205	Polyvinyl chloride pressure pipe, 2-1/2", class 200, SDR 21, includes trenching to 3' deep	1,122.00	LF	2.48	6.78	2.87	$13,615.92	☐

Total Element Cost **$53,830.26**

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$53,830.26**

Phase Technology Cost Detail Report
(with Markups)

Technology: Permeable Barriers

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17030415	Backfill with Excavated Material	186.63	CY	0.28	6.08	0.70	$1,318.07	☐
18050301	Loam or topsoil, imported topsoil, 6" deep, furnish and place	127.90	LCY	26.13	4.34	1.69	$4,112.88	☐
18050402	Seeding, Vegetative Cover	0.16	ACR	23,943.65	319.89	148.99	$3,906.01	☐
18050413	Watering with 3,000-Gallon Tank Truck, per Pass	0.79	ACR	1.13	29.15	38.62	$54.43	☐
33061011	Temporary Medium Wall Sheet Piling	57,800.00	SF	11.36	5.43	5.97	$1,315,614.70	☐
33061023	Slurry wall installation, normal soil, 26' - 75' excavation	2,666.67	CY	0.00	2.72	1.91	$12,361.88	☐
33061027	Key-in Treatment Wall	186.67	CY	12.76	38.44	12.45	$11,881.55	☐
33061028	Slurry wall installation, level and compact working surface	66.67	CY	0.00	2.75	3.51	$417.10	☐
33061031	Iron Filings	1,000.00	CY	513.76	30.15	33.87	$577,777.80	☐
33061035	Montmorillonite Clay	666.70	CY	341.33	30.15	33.87	$270,246.58	☐
33061042	Pea Gravel	1,000.00	CY	29.17	5.16	3.22	$37,549.50	☐
33230101	2" PVC, Schedule 40, Well Casing	600.00	LF	1.46	3.03	8.03	$7,511.88	☐
33230201	2" PVC, Schedule 40, Well Screen	150.00	LF	3.37	3.91	10.36	$2,645.42	☐
33230301	2" PVC, Well Plug	15.00	EA	7.09	4.55	12.04	$355.28	☐

Phase Technology Cost Detail Report
(with Markups)

Total Element Cost	**$2,245,753.07**
Total 1st Year Technology Cost	**$2,245,753.07**

Phase Technology Cost Detail Report
(with Markups)

Technology: Monitoring

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020401	Disposable Materials per Sample	17.00	EA	10.78	0.00	0.00	$183.21	☐
33020402	Decontamination Materials per Sample	17.00	EA	9.60	0.00	0.00	$163.20	☐
33021509	Monitor well sampling equipment, rental, water quality testing parameter device rental	1.00	WK	301.76	0.00	0.00	$301.76	☐
33022131	Testing, purgeable halocarbons (SW5030/8010)	17.00	EA	173.16	0.00	0.00	$2,943.67	☐
33022132	Testing, purgeable aromatics (SW5030/8020)	17.00	EA	137.58	0.00	0.00	$2,338.82	☐
33231186	Well Development Equipment Rental (weekly)	1.00	WK	558.85	51.53	0.00	$610.38	☐
33232407	PVC bailers, disposable polyethylene, 1.50" OD x 36"	15.00	EA	7.78	0.00	0.00	$116.63	☐

Total Element Cost **$6,657.67**

Phase Technology Cost Detail Report
(with Markups)

Element: General Monitoring

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	120.00	MI	0.16	0.00	0.00	$19.30	☐
33220102	Project Manager	4.00	HR	0.00	96.48	0.00	$385.90	☐
33220105	Project Engineer	30.00	HR	0.00	93.55	0.00	$2,806.61	☐
33220108	Project Scientist	79.00	HR	0.00	108.29	0.00	$8,555.07	☐
33220109	Staff Scientist	80.00	HR	0.00	80.26	0.00	$6,420.91	☐
33220112	Field Technician	33.00	HR	0.00	59.79	0.00	$1,973.22	☐
33220114	Word Processing/Clerical	21.00	HR	0.00	41.65	0.00	$874.73	☐
33220115	Draftsman/CADD	17.00	HR	0.00	54.45	0.00	$925.73	☐

Total Element Cost **$21,961.46**

Total 1st Year Technology Cost **$28,619.14**

Total Phase Cost **$2,490,737.92**

Phase Cost Summary Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Groundwater		
ID:	NAS Pensacola OU 2 Feasibility Study		
Location:	PENSACOLA NAS, FLORIDA		
Modifiers:	**Material**	1.005	
	Labor	0.7	
	Equipment	0.913	
Category:	None		
Report Option:	Fiscal Year		
Description:	Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances		

Site

Name:	Alternative 3: PRB and Riparian Corridors
ID:	NAS Pensacola OU 2 Feasibility Study
Type:	None
Description:	Includes the design, construction, and operation of the PRB and the riparian corridors. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program:	Superfund Remedial

Estimator Information:

Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com

Prepared Date:	11/17/2004

Reviewer Information:

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:54:34 AM

Phase Cost Summary Report
(with Markups)

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com

Date Reviewed: 01/06/2005

Phase

Name: Design
Type: Design
Start Date: 1/1/2005
Description: Design of PRB and riparian corridors

Phase Cost Summary Report
(with Markups)

Phase Name	Phase	Approach	Capital Costs	Design %	RD Cost
Construction & Monitoring	Remedial Action	In Situ Treatment	$2,490,451	5%	$124,523

Total Phase Cost	$124,523
Escalation	$0
Escalated Phase Cost	$124,523

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Groundwater	
ID:	NAS Pensacola OU 2 Feasibility Study	
Location:	PENSACOLA NAS, FLORIDA	
Modifiers:	**Material**	1.005
	Labor	0.7
	Equipment	0.913
Category:	None	
Report Option:	Fiscal Year	
Description:	Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances	

Site

Name: Alternative 3: PRB and Riparian Corridors
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the PRB and the riparian corridors. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 11:56:22 AM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: None
Start Date: 1/1/2005
Description: Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Phase Technology Cost Detail Report
(with Markups)

Technology: Monitoring

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020401	Disposable Materials per Sample	28.00	EA	11.25	0.00	0.00	$315.11	☐
33020402	Decontamination Materials per Sample	28.00	EA	10.02	0.00	0.00	$280.69	☐
33020561	Lysimeter accessories, nylon tubing, 1/4" OD	200.00	LF	0.68	0.00	0.00	$135.10	☐
33020572	Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Daily Rental	8.00	DAY	34.85	0.00	0.00	$278.82	☐
33021509	Monitor well sampling equipment, rental, water quality testing parameter device rental	4.00	WK	315.12	0.00	0.00	$1,260.46	☐
33021618	Testing, purgeable organics (624, 8260)	28.00	EA	187.94	0.00	0.00	$5,262.39	☐
33021619	Testing, semi-volatile organics (625, 8270)	16.00	EA	334.52	0.00	0.00	$5,352.27	☐
33021620	Testing, TAL metals (6010/7000s)	16.00	EA	391.35	0.00	0.00	$6,261.68	☐
33230614	Peristaltic Pump, Weekly Rental	4.00	WK	154.90	0.00	0.00	$619.61	☐
				Total Element Cost			**$19,766.14**	

Phase Technology Cost Detail Report
(with Markups)

Element: General Monitoring

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	160.00	MI	0.16	0.00	0.00	$25.73	☐
33220102	Project Manager	4.00	HR	0.00	98.30	0.00	$393.18	☐
33220105	Project Engineer	30.00	HR	0.00	95.32	0.00	$2,859.56	☐
33220108	Project Scientist	162.00	HR	0.00	110.34	0.00	$17,874.30	☐
33220109	Staff Scientist	112.00	HR	0.00	81.78	0.00	$9,158.88	☐
33220112	Field Technician	46.00	HR	0.00	60.92	0.00	$2,802.45	☐
33220114	Word Processing/Clerical	26.00	HR	0.00	42.44	0.00	$1,103.43	☐
33220115	Draftsman/CADD	22.00	HR	0.00	55.48	0.00	$1,220.60	☐

Total Element Cost **$35,438.14**

Total 1st Year Technology Cost **$55,204.27**

Total Phase Cost **$55,204.27**

Cost Estimates for

Remedial Action Alternatives for Groundwater Contamination at OU 2

Alternative 4

Groundwater Pumping and Discharge to FOTW

Subsections:

Site cost over time and present value
Phase technology cost detail for construction
Phase cost summary for design
Phase technology cost detail for O&M
Phase technology cost detail for long-term groundwater monitoring

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	**Reviewer**
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/17/2004	1/6/2005

Phase	**Phase Name**	**Fiscal Year 1 2005**	**Fiscal Year 2 2006**	**Fiscal Year 3 2007**
Design	Design	$64,333		
Remedial Action	Construction (Capital)	$817,080		
Operations & Maintenance	O&M		$58,429	$78,946
Long Term Monitoring	LTM	$41,394	$55,192	$55,192
Sub-Total		$922,807	$113,621	$134,138
Escalation Factor		1.0000	1.0150	1.0323
Total		$922,807	$115,325	$138,471
		2005	**2006**	**2007**
Discount Rate	6.0%			
Present Value	2005	$922,807	$108,797	$123,238

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 4 2008**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$77,905	$78,946	$82,068
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$133,097	$134,138	$137,260
Escalation Factor		1.0519	1.0729	1.0944
Total		$140,005	$143,917	$150,217
		2008	**2009**	**2010**
Discount Rate	6.0%			
Present Value	2005	$117,551	$113,995	$112,251

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
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Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**	**Fiscal Year 9 2013**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$77,905	$78,946	$77,905
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$133,097	$134,138	$133,097
Escalation Factor		1.1163	1.1386	1.1613
Total		$148,576	$152,729	$154,566
		2011	**2012**	**2013**
Discount Rate	6.0%			
Present Value	2005	$104,741	$101,574	$96,977

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
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Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$78,946	$87,271	$77,905
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$134,138	$142,463	$133,097
Escalation Factor		1.1846	1.2083	1.2324
Total		$158,900	$172,138	$164,029
		2014	**2015**	**2016**
Discount Rate	6.0%			
Present Value	2005	$94,053	$96,121	$86,408

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
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	4545 Fuller Drive, Suite 230
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Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 13 2017**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$78,946	$77,905	$78,946
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$134,138	$133,097	$134,138
Escalation Factor		1.2571	1.2822	1.3079
Total		$168,625	$170,657	$175,439
		2017	**2018**	**2019**
Discount Rate	6.0%			
Present Value	2005	$83,801	$80,011	$77,597

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
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Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 16 2020**	**Fiscal Year 17 2021**	**Fiscal Year 18 2022**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$82,068	$77,905	$78,946
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$137,260	$133,097	$134,138
Escalation Factor		1.3340	1.3607	1.3879
Total		$183,105	$181,105	$186,170
		2020	**2021**	**2022**
Discount Rate	6.0%			
Present Value	2005	$76,403	$71,291	$69,137

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
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Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 19 2023**	**Fiscal Year 20 2024**	**Fiscal Year 21 2025**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$77,905	$78,946	$87,271
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$133,097	$134,138	$142,463
Escalation Factor		1.4157	1.4440	1.4729
Total		$188,426	$193,695	$209,834
		2023	**2024**	**2025**
Discount Rate	6.0%			
Present Value	2005	$66,014	$64,019	$65,427

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
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Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 22 2026**	**Fiscal Year 23 2027**	**Fiscal Year 24 2028**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$77,905	$78,946	$77,905
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$133,097	$134,138	$133,097
Escalation Factor		1.5023	1.5324	1.5630
Total		$199,952	$205,553	$208,031
		2026	**2027**	**2028**
Discount Rate	6.0%			
Present Value	2005	$58,817	$57,042	$54,462

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
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Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$78,946	$82,068	$77,905
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$134,138	$137,260	$133,097
Escalation Factor		1.5943	1.6262	1.6587
Total		$213,856	$223,212	$220,768
		2029	**2030**	**2031**
Discount Rate	6.0%			
Present Value	2005	$52,818	$52,008	$48,527

Cost Database Date: 2005
Cost Type: User-Defined
Date: 1/14/2005
Time: 1:25 PM

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 28 2032**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$78,946	$77,905	$78,946
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$134,138	$133,097	$134,138
Escalation Factor		1.6919	1.7257	1.7602
Total		$226,948	$229,686	$236,110
		2032	**2033**	**2034**
Discount Rate	6.0%			
Present Value	2005	$47,062	$44,933	$43,576

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 4: GW Pumping & FOTW Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
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Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 31 2035**	**Fiscal Year 32 2036**	**Row Total**
Design	Design			$64,333
Remedial Action	Construction (Capital)			$817,080
Operations & Maintenance	O&M	$87,271	$19,476	$2,390,229
Long Term Monitoring	LTM	$13,798		$1,655,760
Sub-Total		$101,069	$19,476	$4,927,402
Escalation Factor		1.7954	1.8313	
Total		$181,459	$35,667	$6,399,979
		2035	**2036**	
Discount Rate	6.0%			
Present Value	2005	$31,594	$5,858	$3,228,911

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Groundwater
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name: Alternative 4: GW Pumping & FOTW Discharge
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the groundwater extraction system and conveyance to the FOTW. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Construction
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: In Situ
Start Date: 9/1/2005
Media/Waste Type: Groundwater
Secondary Media/Waste Type: Soil
Contaminant: Volatile Organic Compounds (VOCs)
Secondary Contaminant: Semi-Volatile Organic Compounds (SVOCs)
Markup Template: System Defaults
O&M Markup Template: N/A
Description: Construction 16 extraction wells to 25 ft. Also includes design, recovery pumps and controls, and construction of discharge conveyances and lifts.

Phase Technology Cost Detail Report
(with Markups)

Technology: Groundwater Extraction Wells

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010101	Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	0.00	1,080.94	1,090.98	$2,171.92	☐
33020303	Organic Vapor Analyzer Rental, per Day	36.00	DAY	148.34	0.00	0.00	$5,340.19	☐
33170808	Decontaminate Rig, Augers, Screen (Rental Equipment)	28.00	DAY	21.61	421.82	0.00	$12,416.00	☐
33220112	Field Technician	91.00	HR	0.00	59.79	0.00	$5,441.31	☐
33230103	6" PVC, Schedule 40, Well Casing	80.00	LF	5.08	4.37	11.56	$1,681.06	☐
33230157	2" Pitless Adapter	16.00	EA	245.46	0.00	19.32	$4,236.49	☐
33230203	6" PVC, Schedule 40, Well Screen	320.00	LF	11.58	7.28	19.27	$12,199.58	☐
33230303	6" PVC, Well Plug	16.00	EA	77.95	11.38	30.10	$1,910.84	☐
33230555	4" Submersible Pump, 56-95 GPM, 41'< Head <=100', 3 hp, w/ controls	16.00	EA	4,049.65	0.00	0.00	$64,794.34	☐
33231103	Hollow Stem Auger, 11" Dia Borehole, Depth <= 100 ft	384.00	LF	0.00	13.00	34.40	$18,199.80	☐
33231172	Split Spoon Sample, 2" x 24", During Drilling	39.00	EA	52.95	0.00	0.00	$2,064.94	☐
33231182	DOT steel drums, 55 gal., open, 17C	103.00	EA	106.12	0.00	0.00	$10,930.01	☐

Phase Technology Cost Detail Report
(with Markups)

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33231186	Well Development Equipment Rental (weekly)	16.00	WK	558.85	51.53	0.00	$9,766.04	☐
33231403	6" Screen, Filter Pack	320.00	LF	9.68	6.60	17.46	$10,797.66	☐
33231813	6" Well, Portland Cement Grout	1.00	LF	11.98	0.00	0.00	$11.98	☐
33232103	6" Well, Bentonite Seal	16.00	EA	44.99	40.95	108.38	$3,109.12	☐
33232206	Restricted Area, Well Protection (with 4 Posts & Explosionproof Receptacle)	16.00	EA	717.67	567.28	2.87	$20,605.29	☐

Total Element Cost **$185,676.57**

Total 1st Year Technology Cost **$185,676.57**

Phase Technology Cost Detail Report
(with Markups)

Technology: Discharge to POTW

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17010107	Medium Brush, Medium Trees, Clear, Grub, Haul	1.00	ACR	0.00	4,299.53	1,593.29	$5,892.82	☐
17030259	Excavating, trench, medium soil, 6' to 10' deep, 1-1/2 C.Y. bucket, gradall, excludes sheeting or dewatering	1,038.00	BCY	0.00	0.44	0.28	$746.22	☐
17030401	950, 3.00 CY, Backfill with Excavated Material	1,008.00	CY	0.00	0.59	0.89	$1,493.05	☐
18050402	Seeding, Vegetative Cover	1.00	ACR	23,943.65	319.89	148.99	$24,412.53	☐
19010212	8", Class 150, PVC Piping	3,000.00	LF	7.02	7.51	0.78	$45,904.20	☐
19020201	Precast, CIP Base, 4' Diameter, 6' Deep, Manhole	1.00	EA	833.56	479.04	62.67	$1,375.26	☐
19020307	Packaged, sewage lift station, 800,000 GPD, excludes fencing or external piping	2.00	EA	173,044.04	45,713.42	12,774.94	$463,064.81	☐
19020312	24' x 60" Diameter Reinforced Concrete Pipe Wet Well for Lift Station	2.00	EA	29,886.91	8,995.30	5,374.81	$88,514.04	☐
				Total Element Cost			**$631,402.94**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$631,402.94**
Total Phase Cost	**$817,079.51**

Phase Cost Summary Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Groundwater		
ID:	NAS Pensacola OU 2 Feasibility Study		
Location:	PENSACOLA NAS, FLORIDA		
Modifiers:	**Material**	1.005	
	Labor	0.7	
	Equipment	0.913	
Category:	None		
Report Option:	Fiscal Year		
Description:	Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances		

Site

Name:	Alternative 4: GW Pumping & FOTW Discharge
ID:	NAS Pensacola OU 2 Feasibility Study
Type:	None
Description:	Includes the design, construction, and operation of the groundwater extraction system and conveyance to the FOTW. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program:	Superfund Remedial

Estimator Information:

Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
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Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Reviewer Information:

Phase Cost Summary Report
(with Markups)

Name:	Ben Brantley, P.G.
Title:	Geologist
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Business Address:	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	901-372-7962
Email:	bbrantley@ensafe.com
Date Reviewed:	01/06/2005

Phase

Name:	Design
Type:	Design
Start Date:	1/1/2005
Description:	Design of groundwater extraction system, conveyances, lifts, and controls.

Phase Cost Summary Report
(with Markups)

Phase Name	Phase	Approach	Capital Costs	Design %	RD Cost
Construction	Remedial Action	In Situ Treatment	$817,080	8%	$64,333

Total Phase Cost	$64,333
Escalation	$0
Escalated Phase Cost	$64,333

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Groundwater
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers:

Material	1.005
Labor	0.7
Equipment	0.913

Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name: Alternative 4: GW Pumping & FOTW Discharge
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the groundwater extraction system and conveyance to the FOTW. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:

Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
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Irving, TX 75038

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 12:01:35 PM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: O&M
Type: Operations & Maintenance
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: Ex Situ
Start Date: 1/1/2006

Media/Waste Type: Groundwater
Secondary Media/Waste Type: Structures and Equipment
Contaminant: Volatile Organic Compounds (VOCs)
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: System Defaults

Description: O&M of groundwater pumps, lift stations, and compliance sampling for FOTW for 30 years.

Phase Technology Cost Detail Report
(with Markups)

Technology: Operations and Maintenance

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010202	Sample collection, sampling personnel travel, per diem	12.00	DAY	120.00	0.00	0.00	$1,440.00	☑
33010206	Mobilize Crew, Local, per Person	12.00	EA	53.44	0.00	0.00	$641.24	☐
33010423	Disposable Gloves (Latex)	180.00	PR	0.27	0.00	0.00	$48.98	☐
33010425	Disposable Coveralls (Tyvek)	180.00	EA	6.14	0.00	0.00	$1,104.48	☐
33190340	Non Haz Drummed Site Waste - Load, Transp, & Landfill Disp (55-Gal Drums)	5.00	EA	282.04	0.00	0.00	$1,410.19	☐
33199921	DOT steel drums, 55 gal., open, 17C	5.00	EA	110.81	0.00	0.00	$554.06	☐
33220112	Field Technician	12.00	HR	0.00	60.92	0.00	$731.07	☐
99020110	Annual Maintenance Materials and Labor	1.00	LS	426.70	533.37	231.43	$1,191.50	☑

Total Element Cost **$7,121.53**

Element: Groundwater Extraction Wells

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220106	Staff Engineer	51.00	HR	0.00	83.41	0.00	$4,254.08	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Groundwater Extraction Wells

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220112	Field Technician	255.00	HR	0.00	60.92	0.00	$15,535.31	☐
33420101	Electrical Charge	106,452.00	KWH	0.09	0.00	0.00	$9,655.20	☐

Total Element Cost **$29,444.59**

Element: Discharge to POTW

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020510	Analysis of Wastewater for POTW Permit	12.00	EA	228.38	0.00	0.00	$2,740.55	☐
33220106	Staff Engineer	69.00	HR	0.00	83.41	0.00	$5,755.52	☐
33220112	Field Technician	345.00	HR	0.00	60.92	0.00	$21,018.37	☐
33420101	Electrical Charge	153,055.00	KWH	0.09	0.00	0.00	$13,882.09	☐

Total Element Cost **$43,396.53**

Total 1st Year Technology Cost	**$79,962.65**
Runtime Percent Cost Adjustment	**97%**
O & M Total Cost	**$77,563.77**
Total Phase Cost	**$77,563.77**

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 12:01:35 PM

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Groundwater
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name: Alternative 4: GW Pumping & FOTW Discharge
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the groundwater extraction system and conveyance to the FOTW. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 12:02:37 PM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: None
Start Date: 1/1/2005

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Description: Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives

Phase Technology Cost Detail Report
(with Markups)

Technology: Monitoring

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020401	Disposable Materials per Sample	28.00	EA	11.25	0.00	0.00	$315.11	☐
33020402	Decontamination Materials per Sample	28.00	EA	10.02	0.00	0.00	$280.69	☐
33020561	Lysimeter accessories, nylon tubing, 1/4" OD	200.00	LF	0.68	0.00	0.00	$135.10	☐
33020572	Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Daily Rental	8.00	DAY	34.85	0.00	0.00	$278.82	☐
33021509	Monitor well sampling equipment, rental, water quality testing parameter device rental	4.00	WK	315.12	0.00	0.00	$1,260.46	☐
33021618	Testing, purgeable organics (624, 8260)	28.00	EA	187.94	0.00	0.00	$5,262.39	☐
33021619	Testing, semi-volatile organics (625, 8270)	16.00	EA	334.52	0.00	0.00	$5,352.27	☐
33021620	Testing, TAL metals (6010/7000s)	16.00	EA	391.35	0.00	0.00	$6,261.68	☐
33230614	Peristaltic Pump, Weekly Rental	4.00	WK	154.90	0.00	0.00	$619.61	☐
				Total Element Cost			**$19,766.14**	

Phase Technology Cost Detail Report
(with Markups)

Element: General Monitoring

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	160.00	MI	0.16	0.00	0.00	$25.73	☐
33220102	Project Manager	4.00	HR	0.00	98.30	0.00	$393.18	☐
33220105	Project Engineer	30.00	HR	0.00	95.32	0.00	$2,859.56	☐
33220108	Project Scientist	162.00	HR	0.00	110.34	0.00	$17,874.30	☐
33220109	Staff Scientist	112.00	HR	0.00	81.78	0.00	$9,158.88	☐
33220112	Field Technician	46.00	HR	0.00	60.92	0.00	$2,802.45	☐
33220114	Word Processing/Clerical	26.00	HR	0.00	42.44	0.00	$1,103.43	☐
33220115	Draftsman/CADD	22.00	HR	0.00	55.48	0.00	$1,220.60	☐

Total Element Cost **$35,438.14**

Total 1st Year Technology Cost **$55,204.27**

Total Phase Cost **$55,204.27**

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 12:02:37 PM

Cost Estimates for

Remedial Action Alternatives for Groundwater Contamination at OU 2

Alternative 5

Groundwater Pumping, Treatment, and Discharge to Wetlands

Subsections:

Site cost over time and present value
Phase technology cost detail for construction
Phase cost summary for design
Phase technology cost detail for O&M
Phase technology cost detail for long-term groundwater monitoring

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

Location: PENSACOLA NAS, FLORIDA
Report Option: Fiscal
Initial Phase Start Date: 1/1/2005

	Estimator	Reviewer
Name:	Alan Noell, Ph.D., P.E.	Ben Brantley, P.G.
Title:	Senior Environmental Engineer	Geologist
Agency/Org./Office:	EnSafe Inc.	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038	5724 Summer Trees Dr. Memphis, TN 38134
Phone:	972-791-3222	901-372-7962
Email:	anoell@ensafe.com	bbrantley@ensafe.com
Prepared Date:	11/17/2004	1/6/2005

Phase	Phase Name	Fiscal Year 1 2005	Fiscal Year 2 2006	Fiscal Year 3 2007
Design	Design	$72,780		
Remedial Action	Construction (Capital)	$1,455,601		
Operations & Maintenance	O&M		$759,148	$882,340
Long Term Monitoring	LTM	$41,394	$55,192	$55,192
Sub-Total		$1,569,775	$814,340	$937,532
Escalation Factor		1.0000	1.0150	1.0323
Total		$1,569,776	$826,555	$967,815
		2005	**2006**	**2007**
Discount Rate	6.0%			
Present Value	2005	$1,569,776	$779,769	$861,352

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 4 2008**	**Fiscal Year 5 2009**	**Fiscal Year 6 2010**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$639,924	$584,521	$604,450
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$695,116	$639,713	$659,642
Escalation Factor		1.0519	1.0729	1.0944
Total		$731,193	$686,349	$721,912
		2008	**2009**	**2010**
Discount Rate	6.0%			
Present Value	2005	$613,924	$543,653	$539,455

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 7 2011**	**Fiscal Year 8 2012**	**Fiscal Year 9 2013**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$505,906	$510,067	$480,379
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$561,098	$565,259	$535,571
Escalation Factor		1.1163	1.1386	1.1613
Total		$626,354	$643,604	$621,958
		2011	**2012**	**2013**
Discount Rate	6.0%			
Present Value	2005	$441,555	$428,033	$390,224

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 10 2014**	**Fiscal Year 11 2015**	**Fiscal Year 12 2016**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$491,453	$637,664	$461,233
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$546,645	$692,856	$516,425
Escalation Factor		1.1846	1.2083	1.2324
Total		$647,556	$837,178	$636,443
		2014	**2015**	**2016**
Discount Rate	6.0%			
Present Value	2005	$383,288	$467,476	$335,270

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 13 2017**	**Fiscal Year 14 2018**	**Fiscal Year 15 2019**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$476,224	$453,788	$469,976
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$531,416	$508,980	$525,168
Escalation Factor		1.2571	1.2822	1.3079
Total		$668,043	$652,614	$686,867
		2017	**2018**	**2019**
Discount Rate	6.0%			
Present Value	2005	$331,997	$305,971	$303,802

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 16 2020**	**Fiscal Year 17 2021**	**Fiscal Year 18 2022**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$524,677	$446,342	$463,533
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$579,869	$501,534	$518,725
Escalation Factor		1.3340	1.3607	1.3879
Total		$773,546	$682,438	$719,938
		2020	**2021**	**2022**
Discount Rate	6.0%			
Present Value	2005	$322,774	$268,639	$267,360

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 19 2023**	**Fiscal Year 20 2024**	**Fiscal Year 21 2025**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$442,838	$460,430	$611,539
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$498,030	$515,622	$666,731
Escalation Factor		1.4157	1.4440	1.4729
Total		$705,062	$744,559	$982,029
		2023	**2024**	**2025**
Discount Rate	6.0%			
Present Value	2005	$247,014	$246,087	$306,201

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 22 2026**	**Fiscal Year 23 2027**	**Fiscal Year 24 2028**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$438,897	$456,885	$436,866
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$494,089	$512,077	$492,058
Escalation Factor		1.5023	1.5324	1.5630
Total		$742,270	$784,707	$769,087
		2026	**2027**	**2028**
Discount Rate	6.0%			
Present Value	2005	$218,343	$217,760	$201,345

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 25 2029**	**Fiscal Year 26 2030**	**Fiscal Year 27 2031**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$455,035	$511,381	$434,429
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$510,227	$566,573	$489,621
Escalation Factor		1.5943	1.6262	1.6587
Total		$813,456	$921,362	$812,136
		2029	**2030**	**2031**
Discount Rate	6.0%			
Present Value	2005	$200,906	$214,676	$178,516

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 28 2032**	**Fiscal Year 29 2033**	**Fiscal Year 30 2034**
Design	Design			
Remedial Action	Construction (Capital)			
Operations & Maintenance	O&M	$452,794	$433,106	$451,567
Long Term Monitoring	LTM	$55,192	$55,192	$55,192
Sub-Total		$507,986	$488,298	$506,759
Escalation Factor		1.6919	1.7257	1.7602
Total		$859,462	$842,656	$891,997
		2032	**2033**	**2034**
Discount Rate	6.0%			
Present Value	2005	$178,225	$164,849	$164,624

Site Cost Over Time Report (with Markups)

Folder: NASP OU2
Project Name: OU 2 Groundwater
Project ID: NAS Pensacola OU 2 Feasibility Study
Site Name: Alternative 5: GW Pumping & NPDES Discharge
Site Type: None
Site ID: NAS Pensacola OU 2 Feasibility Study

	Estimator
Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
	4545 Fuller Drive, Suite 230
Business Address:	Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com
Prepared Date:	11/17/2004

Phase	**Phase Name**	**Fiscal Year 31 2035**	**Fiscal Year 32 2036**	**Row Total**
Design	Design			$72,780
Remedial Action	Construction (Capital)			$1,455,601
Operations & Maintenance	O&M	$603,432	$107,863	$15,688,687
Long Term Monitoring	LTM	$13,798		$1,655,760
Sub-Total		$617,230	$107,863	$18,872,828
Escalation Factor		1.7954	1.8313	
Total		$1,108,174	$197,529	$24,874,627
		2035	**2036**	
Discount Rate	6.0%			
Present Value	2005	$192,944	$32,445	$11,918,251

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Groundwater
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name: Alternative 5: GW Pumping & NPDES Discharge
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the groundwater extraction system, an air stripping and GAC groundwater treatment system, NPDES permit, and conveyance to adjacent wetlands. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 12:07:23 PM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Construction
Type: Remedial Action
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: In Situ
Start Date: 9/1/2005

Media/Waste Type: Groundwater
Secondary Media/Waste Type: Soil
Contaminant: Volatile Organic Compounds (VOCs)
Secondary Contaminant: Semi-Volatile Organic Compounds (SVOCs)
Markup Template: System Defaults
O&M Markup Template: N/A

Description: Construction 16 extraction wells to 25 ft. Also includes design, recovery pumps and controls, construction of discharge conveyances and lifts, and construction of air stripping and GAC treatment units for 1,120 gpm flow.

Phase Technology Cost Detail Report
(with Markups)

Technology: Groundwater Extraction Wells

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010101	Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	0.00	1,080.94	1,090.98	$2,171.92	☐
33020303	Organic Vapor Analyzer Rental, per Day	36.00	DAY	148.34	0.00	0.00	$5,340.19	☐
33170808	Decontaminate Rig, Augers, Screen (Rental Equipment)	28.00	DAY	21.61	421.82	0.00	$12,416.00	☐
33220112	Field Technician	91.00	HR	0.00	59.79	0.00	$5,441.31	☐
33230103	6" PVC, Schedule 40, Well Casing	80.00	LF	5.08	4.37	11.56	$1,681.06	☐
33230157	2" Pitless Adapter	16.00	EA	245.46	0.00	19.32	$4,236.49	☐
33230203	6" PVC, Schedule 40, Well Screen	320.00	LF	11.58	7.28	19.27	$12,199.58	☐
33230303	6" PVC, Well Plug	16.00	EA	77.95	11.38	30.10	$1,910.84	☐
33230555	4" Submersible Pump, 56-95 GPM, 41'< Head <=100', 3 hp, w/ controls	16.00	EA	4,049.65	0.00	0.00	$64,794.34	☐
33231103	Hollow Stem Auger, 11" Dia Borehole, Depth <= 100 ft	384.00	LF	0.00	13.00	34.40	$18,199.80	☐
33231172	Split Spoon Sample, 2" x 24", During Drilling	39.00	EA	52.95	0.00	0.00	$2,064.94	☐
33231182	DOT steel drums, 55 gal., open, 17C	103.00	EA	106.12	0.00	0.00	$10,930.01	☐

Phase Technology Cost Detail Report
(with Markups)

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33231186	Well Development Equipment Rental (weekly)	16.00	WK	558.85	51.53	0.00	$9,766.04	☐
33231403	6" Screen, Filter Pack	320.00	LF	9.68	6.60	17.46	$10,797.66	☐
33231813	6" Well, Portland Cement Grout	1.00	LF	11.98	0.00	0.00	$11.98	☐
33232103	6" Well, Bentonite Seal	16.00	EA	44.99	40.95	108.38	$3,109.12	☐
33232206	Restricted Area, Well Protection (with 4 Posts & Explosionproof Receptacle)	16.00	EA	717.67	567.28	2.87	$20,605.29	☐

Total Element Cost **$185,676.57**

Total 1st Year Technology Cost **$185,676.57**

Phase Technology Cost Detail Report
(with Markups)

Technology: Discharge to POTW

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
17010107	Medium Brush, Medium Trees, Clear, Grub, Haul	1.00	ACR	0.00	4,299.53	1,593.29	$5,892.82	☐
17030259	Excavating, trench, medium soil, 6' to 10' deep, 1-1/2 C.Y. bucket, gradall, excludes sheeting or dewatering	1,038.00	BCY	0.00	0.44	0.28	$746.22	☐
17030401	950, 3.00 CY, Backfill with Excavated Material	1,008.00	CY	0.00	0.59	0.89	$1,493.05	☐
18050402	Seeding, Vegetative Cover	1.00	ACR	23,943.65	319.89	148.99	$24,412.53	☐
19010212	8", Class 150, PVC Piping	3,000.00	LF	7.02	7.51	0.78	$45,904.20	☐
19020201	Precast, CIP Base, 4' Diameter, 6' Deep, Manhole	1.00	EA	833.56	479.04	62.67	$1,375.26	☐
19020307	Packaged, sewage lift station, 800,000 GPD, excludes fencing or external piping	2.00	EA	173,044.04	45,713.42	12,774.94	$463,064.81	☐
19020312	24' x 60" Diameter Reinforced Concrete Pipe Wet Well for Lift Station	2.00	EA	29,886.91	8,995.30	5,374.81	$88,514.04	☐
				Total Element Cost			**$631,402.94**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$631,402.94**

Phase Technology Cost Detail Report
(with Markups)

Technology: Air Stripping

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18020324	12" Structural Slab on Grade	300.00	SF	6.26	3.92	0.17	$3,103.92	☐
19010212	8", Class 150, PVC Piping	100.00	LF	7.02	7.51	0.78	$1,530.14	☐
19040626	8,000 Gallon Horizontal Plastic Sump with 6" NPT Connection	1.00	EA	6,445.25	892.22	0.00	$7,337.47	☐
33129905	10 Gallon Bypass Chemical Shot Feeder, Floor Mount, 150 Lb ASME	1.00	EA	1,884.26	808.51	0.00	$2,692.77	☐
33130737	Air Stripping, packed tower treatment units, internal parts for air stripper, over 20' high	10.00	LF	209.81	0.00	0.00	$2,098.14	☐
33130738	Air Stripping, packed tower treatment units, 1"-3.5" packing for air strip tower	2,591.00	CF	21.33	0.00	0.00	$55,277.69	☐
33130741	Electrical Controls for Air Stripper	1.00	EA	5,619.17	2,124.32	62.55	$7,806.04	☐
33130749	Install Air Stripper Tower, 9' - 12' Diameter, > 30' High	1.00	EA	0.00	18,612.99	2,822.38	$21,435.37	☐
33130796	Stripping, in-situ vapor extraction of soil, FRP, air stripping towers, 9' dia x height, prefab, FRP, air strip column/shell only	38.00	LF	1,771.25	0.00	0.00	$67,307.47	☐

Phase Technology Cost Detail Report
(with Markups)

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33231306	High Sump Level Switch for Avoiding Overflow	1.00	EA	281.01	175.90	0.00	$456.91	☐
33290171	1,500 GPM, Centrifugal Pump, 100' Head, 50 HP, Cast Iron	2.00	EA	14,562.52	998.88	103.36	$31,329.52	☐
33310160	Stripping, in-situ vapor extraction of soil, blowers for air stripping, 15,000 CFM, 6" pressure, 25 HP	1.00	EA	5,991.11	1,098.73	0.00	$7,089.84	☐

Total Element Cost **$207,465.28**

Total 1st Year Technology Cost **$207,465.28**

Phase Technology Cost Detail Report
(with Markups)

Technology: Carbon Adsorption (Liquid)

Element: N/A

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
18020324	12" Structural Slab on Grade	560.00	SF	6.26	3.92	0.17	$5,793.98	☐
33132031	Aqueous organic & highly toxic wastes, carbon adsorption, liquid phase, modular carbon adsorbers, dual 350 GPM (Series) to 700 GPM (Parallel), 10' dia., 20,000 lb carbon	2.00	EA	181,063.83	20,186.47	3,548.55	$409,597.70	☐
33290171	1,500 GPM, Centrifugal Pump, 100' Head, 50 HP, Cast Iron	1.00	EA	14,562.52	998.88	103.36	$15,664.76	☐

Total Element Cost	**$431,056.44**
Total 1st Year Technology Cost	**$431,056.44**
Total Phase Cost	**$1,455,601.23**

Phase Cost Summary Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Groundwater
ID:	NAS Pensacola OU 2 Feasibility Study
Location:	PENSACOLA NAS, FLORIDA
Modifiers:	**Material** 1.005
	Labor 0.7
	Equipment 0.913
Category:	None
Report Option:	Fiscal Year
Description:	Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name:	Alternative 5: GW Pumping & NPDES Discharge
ID:	NAS Pensacola OU 2 Feasibility Study
Type:	None
Description:	Includes the design, construction, and operation of the groundwater extraction system, an air stripping and GAC groundwater treatment system, NPDES permit, and conveyance to adjacent wetlands. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program:	Superfund Remedial

Estimator Information:

Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038
Phone:	972-791-3222
Email:	anoell@ensafe.com

Prepared Date: 11/17/2004

Reviewer Information:

Phase Cost Summary Report
(with Markups)

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: Design
Type: Design
Start Date: 1/1/2005
Description: Design of groundwater extraction system, conveyances and lifts, and air stripping and GAC treatment system for 1,120 gpm flow.

Phase Cost Summary Report
(with Markups)

Phase Name	Phase	Approach	Capital Costs	Design %	RD Cost
Construction	Remedial Action	In Situ Treatment	$1,455,601	5%	$72,780

Total Phase Cost	$72,780
Escalation	$0
Escalated Phase Cost	$72,780

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name:	OU 2 Groundwater
ID:	NAS Pensacola OU 2 Feasibility Study
Location:	PENSACOLA NAS, FLORIDA
Modifiers:	**Material** 1.005
	Labor 0.7
	Equipment 0.913
Category:	None
Report Option:	Fiscal Year
Description:	Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name:	Alternative 5: GW Pumping & NPDES Discharge
ID:	NAS Pensacola OU 2 Feasibility Study
Type:	None
Description:	Includes the design, construction, and operation of the groundwater extraction system, an air stripping and GAC groundwater treatment system, NPDES permit, and conveyance to adjacent wetlands. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program:	Superfund Remedial

Estimator Information:

Name:	Alan Noell, Ph.D., P.E.
Title:	Senior Environmental Engineer
Agency/Org./Office:	EnSafe Inc.
Business Address:	4545 Fuller Drive, Suite 230 Irving, TX 75038

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 12:08:00 PM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: O&M
Type: Operations & Maintenance
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: Ex Situ
Start Date: 1/1/2006

Media/Waste Type: Groundwater
Secondary Media/Waste Type: Structures and Equipment
Contaminant: Volatile Organic Compounds (VOCs)
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: System Defaults

Description: O&M of groundwater pumps, lift stations, air stripping and GAC treatment unit, and compliance sampling for NPDES discharge for 30 years.

Phase Technology Cost Detail Report
(with Markups)

Technology: Operations and Maintenance

Element: Miscellaneous

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010202	Sample collection, sampling personnel travel, per diem	52.00	DAY	120.00	0.00	0.00	$6,240.00	☑
33010206	Mobilize Crew, Local, per Person	52.00	EA	51.17	0.00	0.00	$2,660.96	☐
33010423	Disposable Gloves (Latex)	440.00	PR	0.26	0.00	0.00	$114.66	☐
33010425	Disposable Coveralls (Tyvek)	440.00	EA	5.88	0.00	0.00	$2,585.44	☐
33190340	Non Haz Drummed Site Waste - Load, Transp, & Landfill Disp (55-Gal Drums)	11.00	EA	270.09	0.00	0.00	$2,970.96	☐
33199921	DOT steel drums, 55 gal., open, 17C	11.00	EA	106.12	0.00	0.00	$1,167.28	☐
33220112	Field Technician	52.00	HR	0.00	59.79	0.00	$3,109.32	☐
99020110	Annual Maintenance Materials and Labor	1.00	LS	7,519.52	9,183.13	3,793.03	$20,495.68	☑
				Total Element Cost			**$39,344.31**	

Element: Groundwater Extraction Wells

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220106	Staff Engineer	51.00	HR	0.00	81.87	0.00	$4,175.30	☐

Phase Technology Cost Detail Report
(with Markups)

Element: Groundwater Extraction Wells

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33220112	Field Technician	255.00	HR	0.00	59.79	0.00	$15,247.62	☐
33420101	Electrical Charge	106,452.00	KWH	0.09	0.00	0.00	$9,250.68	☐

Total Element Cost **$28,673.61**

Element: Discharge to POTW

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33021618	Testing, purgeable organics (624, 8260)	12.00	EA	179.98	0.00	0.00	$2,159.75	☐
33021619	Testing, semi-volatile organics (625, 8270)	12.00	EA	320.34	0.00	0.00	$3,844.11	☐
33021620	Testing, TAL metals (6010/7000s)	12.00	EA	374.77	0.00	0.00	$4,497.26	☐
33220106	Staff Engineer	69.00	HR	0.00	81.87	0.00	$5,648.94	☐
33220112	Field Technician	345.00	HR	0.00	59.79	0.00	$20,629.14	☐
33420101	Electrical Charge	153,055.00	KWH	0.09	0.00	0.00	$13,300.48	☐

Total Element Cost **$50,079.67**

Phase Technology Cost Detail Report
(with Markups)

Element: Air Stripping

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33021829	Testing, non-rad lab tests, summa canisters by GC/MS to-14	12.00	EA	574.26	0.00	0.00	$6,891.14	☐
33220106	Staff Engineer	63.00	HR	0.00	81.87	0.00	$5,157.73	☐
33220112	Field Technician	313.00	HR	0.00	59.79	0.00	$18,715.71	☐
33420101	Electrical Charge	808,884.00	KWH	0.09	0.00	0.00	$70,292.02	☐
				Total Element Cost			**$101,056.59**	

Element: Carbon Adsorption (Liquid)

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33132052	Aqueous organic & highly toxic wastes, carbon adsorption, liquid phase, bulk liquid phase activated carbon	465,405.00	LB	1.28	0.00	0.00	$596,090.72	☐
33132066	Removal, Transport, Regeneration of Spent Carbon, < 2K to 10 K lb	465,405.00	LB	0.37	0.00	0.00	$172,572.17	☐
33220106	Staff Engineer	111.00	HR	0.00	81.87	0.00	$9,087.43	☐
33220112	Field Technician	551.00	HR	0.00	59.79	0.00	$32,946.82	☐
33420101	Electrical Charge	153,055.00	KWH	0.09	0.00	0.00	$13,300.48	☐
				Total Element Cost			**$823,997.63**	

Phase Technology Cost Detail Report
(with Markups)

Total 1st Year Technology Cost	**$1,043,151.81**
Runtime Percent Cost Adjustment	**97%**
O & M Total Cost	**$1,011,857.26**
Total Phase Cost	**$1,011,857.26**

Phase Technology Cost Detail Report
(with Markups)

Folder: NASP OU2

Project

Name: OU 2 Groundwater
ID: NAS Pensacola OU 2 Feasibility Study
Location: PENSACOLA NAS, FLORIDA
Modifiers: **Material** 1.005
Labor 0.7
Equipment 0.913
Category: None
Report Option: Fiscal Year
Description: Includes media-specific Remedial Action Alternatives for groundwater cleanup target level exceedances

Site

Name: Alternative 5: GW Pumping & NPDES Discharge
ID: NAS Pensacola OU 2 Feasibility Study
Type: None
Description: Includes the design, construction, and operation of the groundwater extraction system, an air stripping and GAC groundwater treatment system, NPDES permit, and conveyance to adjacent wetlands. Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives.
Program: Superfund Remedial

Estimator Information:
Name: Alan Noell, Ph.D., P.E.
Title: Senior Environmental Engineer
Agency/Org./Office: EnSafe Inc.
Business Address: 4545 Fuller Drive, Suite 230
Irving, TX 75038

Cost Database Date: 2005
Cost Type: User-Defined
Print Date: 1/11/2005 12:08:45 PM

Phase Technology Cost Detail Report
(with Markups)

Phone: 972-791-3222
Email: anoell@ensafe.com
Prepared Date: 11/17/2004

Reviewer Information:

Name: Ben Brantley, P.G.
Title: Geologist
Agency/Org./Office: EnSafe Inc.
Business Address: 5724 Summer Trees Dr.
Memphis, TN 38134
Phone: 901-372-7962
Email: bbrantley@ensafe.com
Date Reviewed: 01/06/2005

Phase

Name: LTM
Type: Long Term Monitoring
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Approach: None
Start Date: 1/1/2005

Media/Waste Type: N/A
Secondary Media/Waste Type: N/A
Contaminant: None
Secondary Contaminant: None
Markup Template: System Defaults
O&M Markup Template: N/A

Description: Includes groundwater monitoring for 30 years, but not Five-Year Reviews, which are addressed in the soil alternatives

Phase Technology Cost Detail Report
(with Markups)

Technology: Monitoring

Element: Groundwater

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33020401	Disposable Materials per Sample	28.00	EA	11.25	0.00	0.00	$315.11	☐
33020402	Decontamination Materials per Sample	28.00	EA	10.02	0.00	0.00	$280.69	☐
33020561	Lysimeter accessories, nylon tubing, 1/4" OD	200.00	LF	0.68	0.00	0.00	$135.10	☐
33020572	Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Daily Rental	8.00	DAY	34.85	0.00	0.00	$278.82	☐
33021509	Monitor well sampling equipment, rental, water quality testing parameter device rental	4.00	WK	315.12	0.00	0.00	$1,260.46	☐
33021618	Testing, purgeable organics (624, 8260)	28.00	EA	187.94	0.00	0.00	$5,262.39	☐
33021619	Testing, semi-volatile organics (625, 8270)	16.00	EA	334.52	0.00	0.00	$5,352.27	☐
33021620	Testing, TAL metals (6010/7000s)	16.00	EA	391.35	0.00	0.00	$6,261.68	☐
33230614	Peristaltic Pump, Weekly Rental	4.00	WK	154.90	0.00	0.00	$619.61	☐
				Total Element Cost			**$19,766.14**	

Phase Technology Cost Detail Report
(with Markups)

Element: General Monitoring

Assembly	Description	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Cost Override
33010104	Sample collection, vehicle mileage charge, car or van	160.00	MI	0.16	0.00	0.00	$25.73	☐
33220102	Project Manager	4.00	HR	0.00	98.30	0.00	$393.18	☐
33220105	Project Engineer	30.00	HR	0.00	95.32	0.00	$2,859.56	☐
33220108	Project Scientist	162.00	HR	0.00	110.34	0.00	$17,874.30	☐
33220109	Staff Scientist	112.00	HR	0.00	81.78	0.00	$9,158.88	☐
33220112	Field Technician	46.00	HR	0.00	60.92	0.00	$2,802.45	☐
33220114	Word Processing/Clerical	26.00	HR	0.00	42.44	0.00	$1,103.43	☐
33220115	Draftsman/CADD	22.00	HR	0.00	55.48	0.00	$1,220.60	☐

Total Element Cost	**$35,438.14**
Total 1st Year Technology Cost	**$55,204.27**
Total Phase Cost	**$55,204.27**

Cost Database Date: 2005

Cost Type: User-Defined

Print Date: 1/11/2005 12:08:45 PM